REGAL®

OWNER'S MANUAL
38 EXPRESS

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Introduction

Boating is becoming more popular each and every year. There are numerous types of recreational vessels on our waterways today involved in an every growing number of activities. Therefore, as a Regal boat owner it is of the highest priority to learn about general boating practices before operating your vessel.

Your Regal dealer will answer many questions and provide valuable "hands on" information during the completion of the new boat delivery process. In addition, your dealer has received special factory training on the product line and his services should be employed to solve any technical problems and periodic maintenance beyond the scope of this manual. Also, your Regal dealer carries a line of factory approved parts and accessories.

Your Regal dealer can provide information regarding national training organizations such as the U.S. Power Squadron and United States Coast Guard Auxiliary.

Along with other organizations and literature, they can help build your "boating savvy" by developing the necessary skills and awareness to be a safe and confident skipper.

Also, your local library can assist in providing recommended boating literature such as Chapman Piloting Seamanship & Boat Handling by Elbert S. Maloney.

Also, boating information is available on the internet.

Remember, waterway conditions can change in a heartbeat. Knowing how to react quickly comes from experience and knowledge which can be gained through boating education.

Welcome aboard!

WELCOME TO REGAL

I know I speak for everyone at Regal when I welcome you to the ever-growing family of Regal boat owners. You've chosen a vessel that is recognized worldwide for its standard of excellence. Each step in construction has been carefully scrutinized to assure safety, performance, reliability and comfort for both your passengers and yourself.

Your boat is certified by the National Marine Manufacturers Association. It also complies with the applicable standards set by the United States Coast Guard , American Boat and Yacht Council and the International Marine Certification Institute. Your Regal boat was built with the same attention to detail and quality of construction that we would expect in a vessel we would purchase ourselves.

Whether you're a veteran boater or a newcomer, we strongly urge you to read this boat owner's manual thoroughly. Familiarize yourself with the various components of your craft, and heed the safety precautions noted herein.

If you have questions that are not covered in this manual, please consult your authorized Regal dealer for assistance, phone the Regal factory at 407-851-4360 or E-mail us at www.regalboats.com.

Thank you, and welcome to the "World of Regal !"

Duane Kuck
President & CEO

REGAL MARINE INDUSTRIES, INC.
MISSION STATEMENT

With God's help

and a steadfast commitment to integrity,

we will develop a team

of exceptional people and relationships

to provide exceptional customer satisfaction.

REGAL OWNER'S MANUAL

Your Regal boat owner's manual has been compiled with information to assist you in operating your craft with safety and pleasure.

This manual targets specific details of Regal related systems and components along with their location, operation and maintenance that normally is not found in the vendor information. In addition, vendor related equipment information is located within the owner's packet documentation package.

⚠ WARNING

PREVENT INJURY, DEATH, OR
PROPERTY DAMAGE!
READ AND UNDERSTAND
THE PROPULSION OWNER'S MANUAL
BEFORE ATTEMPTING
TO OPERATE THE VESSEL.

The Regal owner's manual is not to be thought of as a complete shop technical document. In addition to the system chapters, there is troubleshooting information devoted to select current standard and optional equipment.

Beyond the owner's manual your Regal dealer has received special factory training and his services should be employed to solve more technical problems. Call 407-851-4360 or go to the internet at www.RegalBoats.com to find the closest Regal dealership.

In keeping with its commitment to improvement Regal Marine Industries, Inc. is continually upgrading the product line. Regal notes that all dimensions, specifications, models, standard and optional equipment is subject to change without notice at any time.

OWNER'S PACKET

An owner's information packet is located on your vessel. *Read and become familiar with the materials.* This packet contains valuable literature on your propulsion package, standard and optional equipment, systems, various care and cleaning instructions along with component warranty information.

Store the information packet in a clean, dry location.

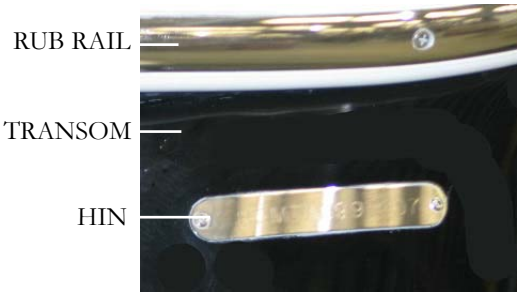
GENERAL INFORMATION

HULL IDENTIFICATION NUMBER (HIN)

The United States Coast Guard has established a universal system of numerically recognizing vessels by using a hull identification number or "HIN." This number identifies your Regal boats' model, hull number, month and year of manufacture. The HIN is normally found on your vessel's transom, on the starboard side, just below the rub rail on the transom vertical surface. The HIN is stamped on a plate and reinforced with a special adhesive. The HIN consists of 12 alpha or numeric characters.

It is recommended that you locate and write down the HIN for future reference. It can be especially useful when ordering parts from your Regal dealer. A second HIN number is found in a hidden location. This second HIN is useful to authorities if the vessel is stolen and/or the original transom HIN is modified or eliminated.

HULL IDENTIFICATION NUMBER



VESSEL INFORMATION SHEET

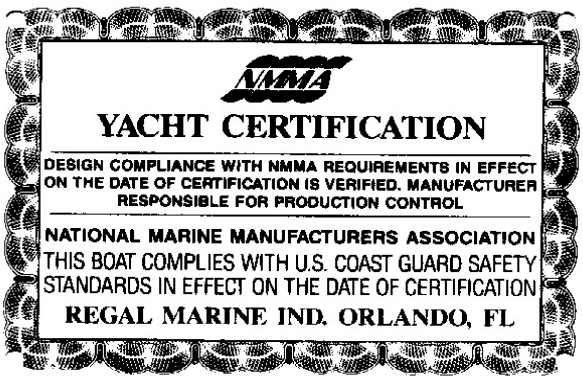
It is recommended that you fill out the information on the following page. It will supply vital statistics on your vessel. Make a copy of the data for safe keeping at home.

VESSEL FLOAT PLAN

Formulate the float plan on the following page before departing. Leave it with a responsible person who will notify the United States Coast Guard or local law enforcement authorities if you do not return as planned. If you change your plans be sure to notify this person. Make copies of the float plan and use one each time you go boating. This will help people know where to find you should you not return on schedule. Do not file the float plan with the United States Coast Guard.

NMMA YACHT CERTIFICATION PLATE

At the helm (dash) area you will notice a metal plate which recognizes that your vessel was built to design compliance in effect on the date the certification was verified. The plate also states that your vessel complies with U. S. Coast Guard safety system standards in effect on the date of certification.


NMMA
YACHT CERTIFICATION
DESIGN COMPLIANCE WITH NMMA REQUIREMENTS IN EFFECT ON THE DATE OF CERTIFICATION IS VERIFIED. MANUFACTURER RESPONSIBLE FOR PRODUCTION CONTROL
NATIONAL MARINE MANUFACTURERS ASSOCIATION
THIS BOAT COMPLIES WITH U.S. COAST GUARD SAFETY STANDARDS IN EFFECT ON THE DATE OF CERTIFICATION
REGAL MARINE IND. ORLANDO, FL

VESSEL INFORMATION

Owner: _____

Address:_____

City & State:_____

Home Phone: _____ Business Phone:_____

In Case Of Emergency Notify: _____

Address _____

City_____State _____

Phone _____

Insurance Agent's Name:_____

Policy#: _____

USCG Phone: _____ Local Police:_____

Marina Phone: _____ Slip (Dock#): _____

Hull Serial #: RGM __ __ __ __ __ __ __ __ __

Key #:_____ Port Engine:_____ Stbd Engine:_____

Key #:_____ Cabin Door: _____

Selling Dealer: _____

Address: _____

City & State: _____

Phone: _____ Fax: _____

Servicing Dealer: _____

Address:_____

City & State:_____

Phone:_____ Fax:_____

VESSEL FLOAT PLAN

Fill out this form before departure. Leave it with a responsible person who will notify the Coast Guard or police if you don't return as planned. If you change your plans be sure to notify this person. Make copies of the float plan and use one each time you go on a trip. This will help people know where to find you should you not return on schedule. Do not file this plan with the Coast Guard.

Owner: _____
Address: _____
City & State: _____
Telephone#: _____
_____
_____
Person Filing Report: _____
Name _____
Telephone _____
_____
_____
Make Of Vessel: _____
Length_____Boat Name_____
Color_____ Trim____ Hp_____
Inboard _____ Stern Drive_____
Hull I.D.# _____
Documented Vessel #_____
_____
Other Information _____
_____
_____
_____
_____

Safety Equipment Aboard: _____
- Life Jackets
- First Aid Kit
- Flares
- Flash Light
- VHF Radio
- Cell Phone __#_____
- Computer __Desk Top ____Lap Top___
- E-mail address_____
- Food_____Water____

State Registration#_____
Destination:
- Leave From _____
- Time Left_____
- Going To _____

Fuel Capacity _____
Est. Day Of Arrival _____
_____
Est. Time Of Arrival _____
If Not Back By____o'clock Call Authorities

Persons Aboard:

Name	Age	Address	Phone

____See Other Side For Additional Persons

VESSEL CRUISE CHECKLIST

- ☐ Obtain a current weather update.
- ☐ Periodically hoist the vessel & inspect the hull bottom and propellers for damage. Marine growth such as barnacles will affect performance and fuel efficiency. Check sacrificial anodes located on the propulsion units, transom and engine. Replace anode if less than 2/3 remaining.
- ☐ Check the electrical system and all safety related equipment. Carry extra fuses. Ensure they are of the proper capacity and type.
- ☐ If your boat has been in the water, run the bilge pump until the flow of water stops.
- ☐ If your boat has been out of the water, check to see that all bilge water has drained.
- ☐ Check that all required safety equipment is on board and in good working condition. Examples include personal flotation devices (PFD's), horn, bell, hand held fire extinguishers, and visual distress signals.
- ☐ Check fuel level. Fuel tanks should be filled to slightly less than capacity. Allow for fuel expansion. Remember the "one third rule".
- ☐ Open engine compartment. Inspect for fuel odors and visible leaks in the fuel, oil, coolant, exhaust and power steering systems.
- ☐ Check the fuel filters for the presence of water .
- ☐ Check fluid levels of engines, drives and generator.
- ☐ Visually inspect engine for cracked hoses, belts and loose hardware.

RECOMMENDED ON BOARD EQUIPMENT

TOOLS

Allen Wrenches
Jack Knife
Phillips Screwdriver
System
Regular & Needle Nose Pliers
Combination Box & End Wrench Set
Screwdriver Set (One With Various Tips)
Side Cutters
Ratchet & Socket Set
Electrical Crimper,Cutter,Stripper Combo
Hammer
VOA Electrical Tester
Water Pump Pliers
Vise Grip Pliers
Floating Flashlight/Lantern
Oil/Fuel Filter Wrench
Tape Rule

SPARE PARTS

Fuel Filters-Engines & Generator
Poly V- Belt (See Engine Manual)
Coolant For Engine Freshwater
Extra Light Bulbs
Seawater Filter
Fuses
Propeller Set (See Dealer)
Propeller Hardware
Flashlight Batteries
Engine Spare Parts
Generator Spare Parts
Air Filters-Engine & Generator
Oil Filters-Engine, Generator
Drive Oil Filters

BASIC GEAR & SUPPLIES

Tow Line
Mooring Lines
Dock Fenders
Distress Signals
First Aid Kit
Boat Hook
Charts & Plotting Instruments/Back-up Use
Emergency Food & Water
EPIRB
Bailer or Hand Pump
Extra Hand Held Fire Extinguishers
Personal Floatation Devices
Clean Rags, Diapers (For Under Engine-Oil Leaks)
Sunscreen (SPF 30+)
Bucket/Pans w/Lids-Draining/Storing Used Fluids
Mirror (For Inspection & Emergency Signaling)
Funnel

BASIC GEAR & SUPPLIES

Lubricating Oil, Liquid Wrench
Duct & Electricians Tape
Coolant (Engine Freshwater Side)
Engine, Drive, Power Steering Oil
Boat Soap (Not Dish Soap)
Woody Wax
Vinyl Cleaner
Hydrogen Peroxide (AC Pans)
Life Raft
Rust Stain Remover (Starbrite)
Corrosion Block
Bilge Cleaner
Nylon Windbreaker Suit
Shop Vac (1 Gal. Cap. Wet-Dry)
Squeegee
Binoculars

Owner's Registration & Systems Checklist

Please note that your Regal boat requires the proper registration by your authorized Regal dealer. To initiate the vessel warranty your dealer must complete the owner's registration form and systems checklist at the time of delivery. The owner must sign the paperwork to acknowledge that the dealer has reviewed the boat systems and warranty provisions with the owner. The owner should keep the original paperwork that features a temporary warranty registration. A warranty certificate will be sent after receipt of the paperwork at Regal World Headquarters.

Dealer's Responsibility

Your vessel has undergone rigid quality assurance inspections before leaving the factory. In addition, your dealer has been trained to perform final pre-delivery checks and to service your Regal boat.

Your dealer's responsibilities include:

1. An orientation in the operation of your Regal boat including matters relating to the safe operation of the vessel.

2. Completion and mailing of your boat registration warranty form to Regal.

3. Location of vendor warranties, registration materials, owner's manual, operation, installation and maintenance instructions for auxiliary equipment supplied with or installed on your Regal boat.

Owner's Responsibility

You are entitled to all the benefits and services outlined in your Regal warranty. However, you have certain responsibilities to ensure warranty satisfaction.
These are:

To read the warranty materials and understand them fully.

To examine the vessel in detail at the time of delivery.

Apply the following: boating rules and regulations, safety equipment, environmental regulations, accident reports and warranty regulations terms and conditions.

To read thoroughly all literature supplied with your vessel including this owner's manual and to follow the recommendations in the literature.

To provide proper maintenance and periodic servicing of your vessel and equipment as set forth in the various manuals supplied.

Customer Service

Take the time to write down your dealer's phone number and E-mail address for future reference. Along with your Regal dealer information is a listing below of other phone numbers and web addresses which may prove useful.

Regal Dealer:
Phone: _____
E-mail: _____

Regal Marine Customer Service:
1-800-US REGAL (1-800-877-3425)
regal@regalboats.com
customer.service@regalboats.com

Volvo Penta Of America (24-Hour Hotline Support):
1-800-522-1959
vpa.consumerrelations@volvo.com

Mercury Marine
W6250 Pioneer Road
P.O. Box 1939
Fond Du Lac, WI
54936-1939
Phone 920-929-5040
Fax 920-929-5893
www.mercurymarine.com

REGAL MARINE INDUSTRIES, INC.
LIMITED WARRANTY

Welcome to the Worldwide Family of Regal Owners! We are very pleased that you have chosen a Regal Powerboat!

This document is your Warranty Registration Certificate and Statement of Warranty. Please check the registration information section for accuracy. If this information is not correct or if you change your address at some future date, please notify us at the following address: Regal Marine Industries, Inc. Attention: Warranty Registrations, 2300 Jetport Drive, Orlando, Florida 32809; or E-mail at customer.service@regalboats.com.

Please read the warranty carefully. It contains important information on Regal's claims procedures and your rights and obligations under this warranty.

WHAT IS COVERED: This Limited Warranty applies only to Regal boats beginning with model year 2013.

LIFETIME LIMITED STRUCTURAL HULL WARRANTY: Regal Marine Industries, Inc. warrants to the original retail purchaser of this boat if purchased from an authorized Regal dealer that the selling dealer or Regal will repair or replace the fiberglass hull if it is found to be structurally defective in material or workmanship for as long as the *original* retail purchaser owns the boat. For purposes of this warranty, the hull is defined as the single fiberglass casting which rests on the water. This limited warranty is subject to all limitations and conditions explained below.

FIVE-YEAR TRANSFERABLE LIMITED STRUCTURAL HULL WARRANTY: In addition to the Lifetime Limited Structural Hull Warranty, Regal offers a Transferable Five-Year Limited Structural Hull Warranty. Under the Five-Year Transferable Limited Structural Hull Warranty, Regal will repair or replace the fiberglass hull if it is found to be structurally defective in material or workmanship within the first (5) years after the date of delivery to the original retail purchaser. Any remaining term of this Five-Year Limited Hull Warranty may be transferred to a second owner if within 60 days of purchase, the new owner registers the transfer with Regal and pays the established warranty transfer fee. Contact Regal Customer Service at the above address for details.

FIVE-YEAR LIMITED HULL BLISTER WARRANTY: Regal warrants that the selling dealer or Regal will repair any underwater gelcoated surfaces of the hull against laminate blisters which occur as a result of defects in material or workmanship within (5) years of the date of delivery, provided that the original factory gelcoat surface has not been altered. Alternation would include but is not limited to damage repair; excessive sanding, scraping, sandblasting; or from improper surface preparation for application of a marine barrier coating or bottom paint, any of which shall void this Five-Year Limited Hull Blister Warranty. Proper preparation must be applied to the hull bottom if the boat is to be moored in the water for periods in excess of sixty (60) days. Regal Marine shall repair or cause to be repaired any covered laminate blisters based on the following prorated schedule.

Less than two (2) years from delivery date - 100%, Two (2) to three (3) years from delivery date - 75%, Three (3) to four (4) years from delivery date - 50%, Four (4) to five (5) years from delivery date - 25%.
Reimbursement shall be limited to one repair, not to exceed one hundred ($100.00) dollars per foot of boat length prior to prorating. Regals prior authorization for the method and cost of repair, must be obtained before repairs are commenced. All costs to transport the boat for repairs are the responsibility of the owner.

LIMITED GENERAL WARRANTY: In addition to above hull warranties, Regal warrants to the original purchaser of this boat if purchased from an authorized Regal dealer that the dealer or Regal will repair or replace any parts found to be defective in materials or workmanship for a period of one (1) year from the date of delivery, subject to all exceptions, limitations and conditions contained herein.

LIMITED EXTERIOR FINISH WARRANTY: Regal warrants that the selling dealer or Regal will repair cosmetic defects in the exterior gelcoated finish including cracks or crazing reported to Regal within 90 days from the date of delivery to the original retail purchaser, subject to all limitations and conditions contained herein. All warranty work is to be performed at a Regal dealership or other location authorized by a Regal Customer Service Manager after it is established to Regal's satisfaction that there is a defect in material or workmanship.

REGISTRATION INFORMATION:

CUSTOMER OBLIGATIONS: The following are conditions precedent to the availability of any benefits under these limited warranties:
(a) The purchaser must sign and the dealer must submit to Regal the "NEW BOAT DELIVERY CHECKLIST" within ten (10) days of the date of delivery and such information must be on file at Regal.
(b) The purchaser must first notify the dealer from whom the boat was purchased of any claim under this warranty within the applicablewarranty period and within a reasonable period of time (not to exceed thirty (30) days) after the defect is or should have been discovered; and (2) if such continued use causes other or additional damage to the boat or component parts of the boat.

(c) Regal will not be responsible to repair any condition or replace any part, (1) if the use of the boat is continued after the defect is or should have been discovered; and (2) if such continued use causes other or additional damage to the boat or component parts of the boat.
(d) Based on the dealer's knowledge of Regal's warranty policy and/or consultations with Regal, the dealer will accept the claim and arrange for appropriate repairs to be performed, or deny the claim if it is not within the warranty.
(e) The dealer will contact the Regal boat owner regarding instructions for delivery of boat or part for warranty repair if it is covered by the limited warranty.
ALL COSTS TO TRANSPORT THE BOAT FOR REPAIRS ARE THE RESPONSIBILITY OF THE OWNER;
(f) If the Regal boat owner believes a claim has been denied in error or the dealer has performed the warranty work in an unsatisfactory manner, the owner must notify Regal's Customer Service Department in writing at the address listed for further consideration. Regal will then review the claim and take appropriate follow-up action.

WARRANTY EXCEPTIONS: THIS LIMITED WARRANTY **does not cover and the following are not warranted:**
(a) Engines, metal plating or finishes, windshield breakage, leakage, fading and deterioration of paints, canvas, vinyl, upholstery and fabrics;
(b) Gelcoat surfaces including, but not limited to, cracking, crazing, discoloration or blistering except as noted above;
(c) Accessories and items which were not part of the boat when shipped from the Regal factory, and/or any damage caused thereby;
(d) Damage caused by misuse, accident, galvanic corrosion, negligence, lack of proper maintenance, or improper trailering;
(e) Any boat used for racing, or used for rental or commercial purposes;
(f) Any boat operated contrary to any instructions furnished by Regal, or operated in violation of any federal, state, Coast Guard or other governmental agency laws, rules, or regulations;
(g) The limited warranty is void if alterations have been made to the boat;
(h) Transportation of boat or parts to and/or from the REGAL factory or service location;
(i) Travel time or haul outs, loss of time or inconvenience;
(j) Any published or announced catalog performance characteristics of speed, fuel and oil consumption, and static or dynamic transportation in the water;
(k) Any boat that has been repowered beyond Regal's power recommendations;
(1) Boats damaged by accident and boats damaged while being loaded onto, transported upon or unloaded from trailers, cradles, or other devices used to place boats in water, remove boats from water or store or transport boats on or over land;
(m) Water damage to, dry rot to, condensation to, or absorption by interior surfaces, wood structures or polyurethane foam;
interior wood including, but not limited to, bleeding and/or discoloration as a result of condensation or moisture or water continually contacting the plywood causing staining to upholstery, carpet or other interior surfaces;
(n) Costs or charges derived from inconveniences or loss of use, commercial or monetary loss due to time loss, and any other special, incidental or consequential damage of any kind or nature whatsoever.

NO WAVIER OF THESE ITEMS: The terms, conditions, limitations and disclaimers contained herein cannot be wavered except by the Customer Service Manager of Regal. Any such wavier must be in writing. Neither the dealer, nor the customer, nor any service, sales and/or warranty representative of Regal is authorized to waive and/or modify these conditions, limitations and/or disclaimers.

GENERAL PROVISIONS:
ALL GENERAL, SPECIAL, INDIRECT, INCIDENTAL AND/OR CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM THIS WARRANTY AND ARE TOTALLY DISCLAIMED BY REGAL. IT IS THE INTEREST OF THE PARTIES THAT THE OWNER'S SOLE AND EXCLUSIVE REMEDY IS THE REPAIR OR REPLACEMENT OF THE VESSEL OR ITS ALLEGEDLY DEFECTIVE COMPONENT PARTS AND THAT NO OTHER LEGAL OR EQUITABLE REMEDIES SHALL BE AVAILABLE TO SAID OWNER. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE FOREGOING MAY NOT APPLY TO YOU. THIS IS A LIMITED WARRANTY; REGAL MAKES NO WARRANTY, OTHER THAN CONTAINED HEREIN;
TO THE EXTENT ALLOWED BY LAW ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARISING IN STATE LAW ARE EXPRESSLY EXCLUDED TO THE EXTENT ALLOWED BY LAW. ANY IMPLIED WARRANTY OF MERCHANTABILITY IS LIMITED TO THE PERIOD OF THIS LIMITED WARRANTY. ALL OBLIGATIONS OF REGAL ARE SPECIFICALLY SET FORTH HEREIN. REGAL DOES NOT AUTHORIZE ANY PERSON OR DEALER TO ASSUME ANY LIABILITY IN CONNECTION WITH REGAL BOATS. **Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Regal's obligation with respect to this warranty is limited to making repairs to or replacing the defective parts and no claim for breach of warranty shall be cause for cancellation or rescission of the contract or sale for any boat manufactured by REGAL MARINE INDUSTRIES, INC.**
Regal will discharge its obligations under this warranty as rapidly as possible, but cannot guarantee any specific completion date due to the different nature of claims which may be made and services which may be required. Regal reserves the right to change or improve the design of its boats without obligation to modify any boat previously manufactured. This limited warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. Regal shall in no way be responsible for any repairs not PRE-AUTHORIZED **by a Regal Customer Service Manager or repairs performed by a repair shop not** PRE- AUTHORIZED **by a Regal Customer Service Manager.**

Notes

The information found in this owner's manual may change at any time. Designated items referred to may not be installed on your vessel. In keeping with its commitment to continued product improvement Regal Marine Industries, Inc. reserves the right to modify the vessel at any time without notice including changes in specifications, colors, fabrics, materials and equipment or to discontinue a model. Regal is not obligated to make similar changes or modifications to models sold prior to the date of such changes.

All specifications are approximate including weights, fuel figures and speeds.

Speeds are calculated at sea level with a temperature of 70 to 85 degrees. Increases in altitude and/or temperature will reduce horsepower and thereby reduce the speed of the vessel.

All information is for reference only and should be used as a guideline. Consult local and state guidelines as they may differ in your area. Any decisions relating to safe operation of the vessel are the responsibility of the operator.

Safety On Board

Safety awareness can not be over emphasized. Safety on board needs to be the skippers number one priority. In this manual you will find many safety precautions and symbols to identify safety related items. Heed all safety precaution information. Remember, the skipper is responsible for the safety of his passengers and crew.

SAFETY LABELS

SAFETY PRECAUTION DEFINITION

Safety precautions are stated as caution, warning and danger signal words. They are highlighted in this manual by font design and symbol usage. Also, a *notice* heading is included which provides operation and maintenance information but is not hazard-related. An information label provides tips on a variety of topics. **Become familiar and understand all safety precaution labels!**

DANGER

Immediate hazardous situation that, if not avoided, **will** result in death or serious injury.

WARNING

Potentially hazardous situation that, if not avoided, **could** result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation or unsafe practice that, if not avoided, **may** result in injury, property or product damage.

NOTICE

General or specific information which is important to correct operation or maintenance, **but is not hazard related.**

INFORMATION

Educational tips for the skipper and crew.

PRECAUTIONARY LABELS

Read and understand all safety labels affixed to your Regal boat or found in this manual and the vendor literature. Many of the safety labels are posted close to the helm, aft cockpit, cabin and swim platform. The location of the labels may vary.
Review the helm safety labels with passengers before disembarking.
Use common sense to analyze the result of an action on board your vessel. **Always think safety first!**

NOTICE

DO NOT REMOVE OR COVER
ANY PRECAUTIONARY LABELS.
KEEP HARSH CHEMICALS
AWAY FROM LABELS.
IF A LABEL BECOMES ILLEGIBLE,
CONTACT YOUR REGAL DEALER
FOR ORDERING REPLACEMENTS.

GENERAL BOATING SAFETY

We understand that you are eager to go boating. However, we strongly suggest that you thoroughly familiarize yourself and friends or members of your family with safe boating practices before setting out.
Remember, that along with the freedom and exhilaration of boating comes the responsibility that you have for the safety of your passengers and other boaters who share the water with you.
Boating regulations vary from state to state. Check with your local state and local authorities for the regulations pertaining to your area.

Check with local FM weather stations, U. S. Coast Guard, or on-line for the latest weather conditions. Remember getting caught in severe weather is hazardous. Check weather conditions periodically while you are boating. If you are forced to operate your boat in a storm condition, take common sense precautions; wear PFD's, store gear, reduce speed and if possible head for safe refuge.

It is best to avoid operating your boat in foggy weather. When fog sets in, take bearings, log courses and speeds. You are required to emit a five second blast from your horn or whistle once every minute. Also, have your passengers wear PFD's and observe for oncoming vessels.

Operation in shallow water presents a number of hazards including sand bars and water levels influenced by tides. If the vessel strikes an underwater hazard, check for boat and engine damage. If the engine vibrates excessively after striking an underwater obstruction, it may indicate a damaged propeller. If you run aground, seek help by radio or flares.

Make sure your boat and equipment are in top condition. Do this by frequently inspecting the hull, engine and propulsion components.

Safety On Board

You must provide a Coast Guard approved personal flotation device (PFD) for every person on board. These PFD's should be in good condition and easily accessible.

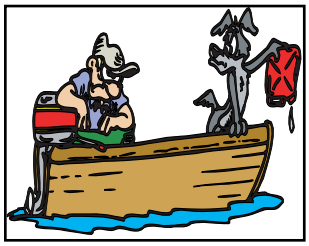
Insist that non-swimmers and children on board wear a PFD at all times. If you encounter rough weather conditions, make sure everyone on board is wearing a PFD, including yourself. Instruct your passengers in how to put on their PFDs and be sure they know their storage location on the boat. Remember, in an emergency, a PFD that cannot be quickly located and worn is useless.

Never allow anyone to sit anywhere on the boat not specifically designed as seating. While underway, ALWAYS insist passengers sit in a seat and set an example by doing this yourself.

Never drink and drive! As captain, you are responsible for the safety of your passengers. Alcohol and boating can be a dangerous combination. DO NOT mix them. Alcohol impairs the boat operators ability to make conscious decisions and react to emergency situations quickly.

Never overload your boat! An overloaded boat, or one with uneven weight distribution can be difficult to steer.

Use maximum caution when fueling. **Never** allow any smoke or flame nearby while you are fueling. **ALWAYS** check for fuel leaks and fumes when fueling is completed.



Be certain there is enough fuel aboard for your cruising needs. Include any reserve that might be needed should you change your plans due to weather or an emergency. **Practice the "one-third rule:** Use one-third of your fuel going out, one-third to return and retain one- third as a reserve.

Always check the weather before departure. Be particularly cautious of forecasted electrical storms and high winds.

Always have up-to-date charts aboard as a back-up to your plotter and auto pilot option. Charts can be obtained at your closet marina, on-line store or by contacting one of three federal government agencies.

Always file a float plan. Leave details of your cruise with someone responsible who will be remaining on shore. Include expected return, plus name and phone number of a contact person in case of emergency.

Use care, courtesy and common sense when launching, docking or operating your boat.

Learn and obey the "Rules of the Road". A weather resistant placard copy of the "Rules of the Road" is included in the on board Regal information packet. Additional information can be obtained from the U.S. Coast Guard Auxiliary or your local Power Squadron organization. In case of emergency know the international distress signals for your VHF radio. The spoken word "MAYDAY" is the international signal of distress and is for emergency use only. Under no circumstances should this word be used, unless there is danger at hand.

Posted speed limits, swimming areas, "no wake" zones and other restrictions should be red-flagged. They are so noted for a reason. Sensible boat use, plus courtesy, equals enjoyable and safe boating.

It is your responsibility to stay abreast of all federal, state and local rules, as some laws or regulations may change or be different from state to state. Contact your local boating agencies for updated information.

We can not stress safety enough! Remember, there are no brakes on your boat, and the water current and wind velocity both affect your ability to respond. The operator must use caution at all times to maintain control of his vessel and especially to keep a safe distance from other boats and obstacles.

Always keep all safety gear in optimum condition. Pay special attention to attached tags and plates indicating expiration dates on equipment such as fire extinguishers, and personal flotation devices. Encourage a periodic maintenance check on all safety equipment. Contact your Regal dealer or marine professional for more information. Again, remember that the captain is responsible for his crew, passengers and vessel.

REQUIRED SAFETY EQUIPMENT

PERSONAL FLOTATION DEVICES

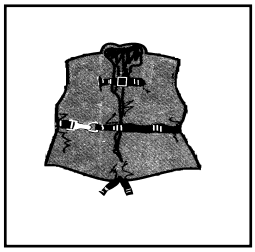
All personal flotation devices (PFD's) must be Coast Guard approved, in good working condition, and must be the correct size for the wearer. All PFD's must be readily accessible. This means being able to wear them in a reasonable amount of time in case of an emergency (fire, boat sinking, etc.). They should not be stored or locked in closed areas. Also, make sure that all coverings are removed such as plastic from any PFD's. Throwable devices such as a ring buoy need to be available for immediate deployment. A PFD should be worn at all times when your boat is operating on the water. A PFD may save your life, but it must be worn to do so.

As a minimum U. S. Coast Guard requirement all recreational boats must carry one type I, II, III, or V PFD (wearable) for each person aboard. See the explaination following for each type. For type V to be counted they must be used according to the label instructions. **In addition, all boats over 16' must carry one Type IV (throwable) PFD.**

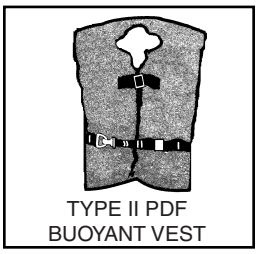
Some states require that PFD's be worn by children of specific ages at all times. Check with local and state boating agencies for particular requirements in your state before taking children on the water. Child life jackets are classified by the child's weight and should like all life jackets be sized before being purchased.

Remember PFD's will not necessarily keep you from drowning, even though they are designed to keep a person from sinking. When purchasing PFD's make sure it safely fits the person wearing it. It is a good idea to test PFD's in a lifeguarded shallow pool before venturing on the water.

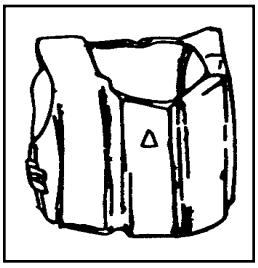
Refer to the USCG minimum equipment requirements at the end of this chapter. It is meant to be a guide only. Contact state and local agencies for additional equipment requirements. Remember as the captain of your vessel you are responsible for its safe operation.



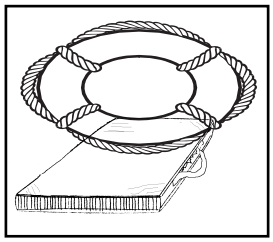
TYPE I- Also known as an off-shore jacket, it provides the most buoyancy. It is a PFD for all waters and is especially useful in rough waters where rescue may encompass additional time. It is designed to turn most unconscious users in the water to a true face-up position. Type I PFD is available in adult & child sizes Buoyancy minimum poundages are 15.5 adult, 11 medium child, and 7 for small child and infants.


TYPE II PDF BUOYANT VEST

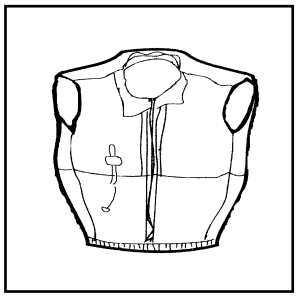
TYPE II- Also known as near-shore buoyant vest, it is recommended for calm, inland water where rescue time will be minimal. It will turn some unconscious people face-up in the water but not as numerous as Type I. They use the same buoyancy minimum poundages as the type I PFD's.



TYPE III- Known as a flotation aid it is good for calm, inland water or where there is a chance for quick rescue. It is designed so wearers can place themselves in a face-up position in the water. The wearer may have to tilt their head back to avoid face-down positions. Type III offer the same buoyancy minimum poundages as the Type II. They are generally the most comfortable for continuous wear. Float coats, fishing vests, and vests featuring designs for various sport activities are examples of Type III.



TYPE IV- Intended for calm, inland water with heavy vessel traffic, where help is constantly present. It is designed to be thrown into the water for someone to grab on to and held until rescued. It is not designed to be worn. Type IV includes ring buoys, buoyant cushions, and horseshoe buoys.



TYPE V- Also known as a special use device this is the least bulky of all PFD's. It contains a small amount of inherent buoyancy, and an inflatable chamber. It is rated even to a Type I, II, or III PFD (as noted on the jacket label) when inflated. Some Type V devices provide significiant hypothermia protection. Varieties include deck suits, work vests, board sailing vests and Hybrid PFD's. Remember that this Type V type PFD may be carried instead of another PFD **only if used according to the approval condition on the label.**

Note: A water skier or wakeboarder is considered on board the vessel and a PFD is required for the purposes of compliance with the PFD carriage requirements. It is advisable and recommended for a skier or wakeboarder to wear a PFD designed to withstand the impact of hitting the water at a high speed. "Impact Class" marking on the label refers to PDF strength, not personal protection. Some state laws require a skier or wakeboarder to wear a PFD.

PFD'S FOR PETS

If you are a skipper who needs to have his pet dog or cat on board or dockside then a PFD is recommended. The PFD will aid you in finding the pet if it should fall overboard. The device must fit the pet properly. Also, it may take a bit of training before the pet is comfortable wearing the PFD. Normally, dogs are easier to train wearing a life vest than a cat.
Marine type retail stores will fit a pet to a PFD by body weight.

MAINTAINING YOUR PFD'S

A PFD is only useful if it is well maintained. Always be aware of PDF age since it has a life expectancy like any other piece of equipment.

√ Check periodically for broken zippers, frayed webbing, water soaked kapok bags, missing straps, and sewing that has become undone.

√ Clean each PFD with mild soap and water only. Again, let dry sufficiently before storing.

√ Keep PFD's out of grease and oil since they can deteriorate the jacket inner and outer materials.

√ Check any kapok-bagged jackets by squeezing. If you hear air escaping the bag is defective and the PFD should be thrown away.

√ Grab the cover with the fingers. If the cover material rips, the PFD is rotted and should be thrown away.

√ If the kapok bag is hard the PFD should be discarded.

FIRE EXTINGUISHERS

GENERAL INFORMATION

Fire extinguishers are classified by a letter and numeric symbol. The letter references the type of fire the unit is designed to extinguish.
For example, type B extinguishers commonly used on boats are designed to put out flammable liquids such as grease, oil and gasoline.
The number indicates the general size of the extinguisher (minimum extinguishing agent weight).
Coast Guard Approved extinguishers are identified by the following marking on the label:

"Marine Type USCG Approved, Size..., Type..., 162.028/.../", etc.

FIRE EXTINGUISHER CONTENTS				
CLASS	FOAM IN GALS.	C02 IN LBS.	DRY CHEM IN LBS.	HALON IN LBS.
B-I	1.25	4	2	2.5
B-II	2.5	15	10	10

MINIMUM PORTABLE FIRE EXTINGUISHERS REQUIRED		
VESSEL LENGTH	**NO FIXED SYSTEM**	**WITH FIXED SYSTEM**
LESS THAN 26'	1 B-1	0
26' TO LESS THAN 40'	2 B-1 OR 1 B-II	1 B-1
40' TO 65'	3 B-1 OR 1 B-1 & 1 B-II	2 B-1 OR 1 B-2

U. S. Coast Guard approved fire extinguishers are required on all Regal yachts. Besides the minimum Coast Guard requirements always check state and local agencies for additional requirements and equipment.
Coast Guard approved extinguishers are hand-portable, either B-I or B-II classification. U. S. Coast Guard approved hand-portable and semi-portable extinguishers contain a metal plate that shows the manufacturers name and extinguisher type, capacity and operating instructions. They have a special marine type mounting bracket which keeps the extinguisher solidly mounted until needed. The extinguisher needs to be mounted in a readily accessible location but one that will not be bumped by people while underway. All approved extinguishers shall have an indication gauge.

U.S.C.G APPROVED FIRE EXTINGUISHER TYPES & FEATURES

■ The dry chemical agent is widely used because of its convenience and low cost. The extinguisher canister is filled with a white dry chemical powder along with a pressurized gas. It is a good idea to shake this type periodically because they tend to "pack" on the canister bottom.

■ The foam type uses a chemical foaming agent plus water and is best when used for fires involving flammable liquids- solvents, gasoline, oil, grease and various paints. It will work on fires involving rubber, plastics, cloth, wood, and paper. It leaves a messy residue. Do not use this extinguisher for electric fires.

■ The carbon dioxide unit uses CO2 gas under high pressure, with a funnel discharge hose usually swivel mounted. This extinguisher leaves no residue and does not cause interior engine harm. To ensure workability, weigh the unit annually. A 10% maximum weight variance is allowed.
Another type of liquified gas used today is FE-241.This gas is colorless and odorless, heavier than air and sinks to the lower bilge to extinguish fires. Since the year 2000 ingredients have changed to a more environmental friendly formula (Chlorotetrafluoroethane or FE-241). FE-241 is used in portable-hand units along with making up the majority of boat automatic fire extinguishing systems. The canister needs to be weighed once a year. These clean agent units feature a dash mount indicator.
Refer to the information regarding fire prevention in this manual.

VISUAL DISTRESS SIGNALS

All vessels used on coastal waters, any of the Great Lakes, territorial seas, and those waters connected directly to them up to a point where a body of water is less than two miles wide, must be equipped with Coast Guard approved visual distress signals.
Vessels owned in the United States operating on the high seas must be equipped with U.S.C.G. approved visual distress signals.

.PYROTECHNIC DEVICES

Pyrotechnic visual distress signals must be Coast Guard approved, be ready for service and must be readily accessible. They all display a marking which is the service life, which must not have expired. A minimum of 3 devices are required for the day and 3 devices for night.
Some devices meet both day and night requirements. Pyrotechnic devices should be stored in a cool, dry location. Most of these devices can be purchased in an highly visible (orange) watertight container. Types of Coast Guard approved pyrotechnic distress signals and associated devices are:

■ Pyrotechnic red flares, hand-held or aerial type.

■ Pyrotechnic orange smoke, hand-held or floating type.

■ Launchers for parachute flares or aerial red meteors.

All in all, each distress signal has certain advantages and disadvantages.
There is no distress signal that is best under all situations.
Pyrotechnics are recognized world-wide as superior distress signals. A downfall is they emit a very hot flame that can cause burns and or ignite flammable materials. Pistol launched and hand-held parachute flares operate consistant with firearms and therefore must be carefully handled. Check with local and state regulations since some of these device are considered firearms and are prohibited.
It is best to carry red aerial flares which are visible from a greater distance. Also, the red parachute flares burn for longer periods and therefore are more likely to be seen by another vessel.

NON-PYROTECHNIC DEVICES

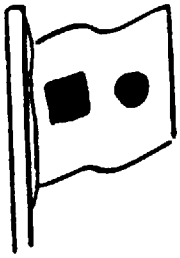
Non-pyrotechnic devices must all be in serviceable condition, readily accessible, and must be certified by the manufacturer to comply with U.S.C.G standards. They include:

■ Orange distress flag.

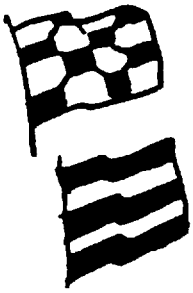
■ Electric distress light.

The distress flag is for day use only. It must be 3 x 3 or larger with a black square and ball on an orange background. It can be spotted when attached to a boat hook, long fishing rod, or paddle with the person waving the flag back and forth overhead.
The electric distress light is for night use only flashing the international SOS distress signal (..._ _ _ ...).
Under Inland Navigation Rules, a high intensity white light that flashes at regular intervals from 50-70 times per minute is considered a distress signal.
Remember that regulations prohibit the display of visual distress signals on the water under any circumstances except when assistance is required to prevent immediate or potential danger to passengers on a vessel.

INTERNATIONAL DISTRESS SIGNALS



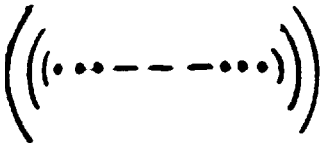
BLACK SQUARE
AND BALL ON
ORANGE BACKGROUND



CODE FLAGS
NOVEMBER
& CHARLIE

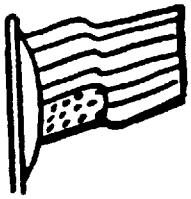
SQUARE FLAG
& BALL

PERSON
WAVING
HANDS

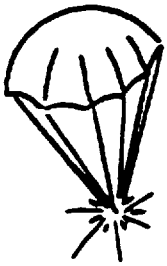


MORSE
CODE S.O.S.

"MAYDAY"
BY
RADIO



ENSIGN
UPSIDE
DOWN

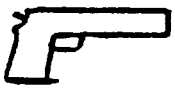


PARACHUTE
RED FLARE

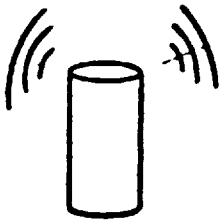
RED METEOR
FLARES

SMOKE

FOG HORN
SOUNDED
CONTINUOSLY

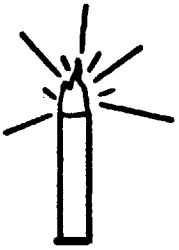


GUN FIRED AT
1- MINUTE
INTERVALS



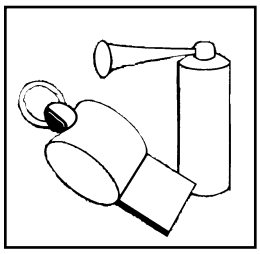
POSITION
INDICATING
RADIO BEACON

DYE MARKER
(ANY COLOR)



HAND-HELD
FLARE

SOUND PRODUCING DEVICES



According to both Inland and International Rules, all boats **must** carry a way of producing an efficient sound signal. If your vessel is 12 meters (39' 4") or longer, a power whistle or power horn and bell must be carried. Bell mouth must be at least 7 7/8" diameter.

The sound signal made in all cases must be capable of a four or six second blast audible for one half mile. See the section discussing bridge and whistle signals for more information.

RADIO COMMUNICATIONS

VHF radios are used for distress and ship to shore and ship to ship communications today. Learn the specialized messages such as **Mayday, Mayday, Mayday**. It is only used when life or vessel is in imminent danger.

Many of the more recent VHF's feature DSC capability which offers the ability to place and receive digital calls directly with vessels and shore stations including USA and Canadian Coast Guards. Channel 70 is reserved exlusively for DSC calls. Refer to the VHF owner's information since you need to establish a Mobile Maritime Safety Identity (MMSI) number before using the DSC feature. A MMSI number identifies each DSC radio, like a telephone number. The FCC requires a ship station license for all vessels equipped with a marine VHF radio.

NAVIGATION LIGHTS

The U. S. Coast Guard requires recreational boats operating at night to display navigation lights between sunset and sunrise along with other periods of reduced visibility.

Navigation lights help avoid collisions by improving the night visibility of vessels. Red and green directional lights, white stern lights, white masthead lights and white all-around lights must be displayed in specified positions, depending on boat size, and mode of operation.

The configuration of visible lights tells an operator the size, direction of travel and means of propulsion (sail, power, rowing or at anchor) of another vessel.

This helps both operators determine who has the right of way. Larger boats are required to carry bigger, brighter lights that are visible over longer distances. See the light requirement chart for pleasure craft.

MARINE SANITATION DEVICES

Recreational vessels under 65' with installed toilet facilities must have an operable marine sanitation device (MSD) on board. Vessels 65' and under may use Type I, II, or III MSD's. All installed MSD's must be U.S. Coast Guard certified. The MSD's are labeled to show conformity to the regulations.

NAVIGATION RULES

The navigation rules establish actions to be taken by vessels to avoid collision. They are divided into Inland/ International. *Operators of vessels 39.4' or more shall have on board and maintain a copy of the Inland navigation rules.*

NAVIGATION LIGHT RULES

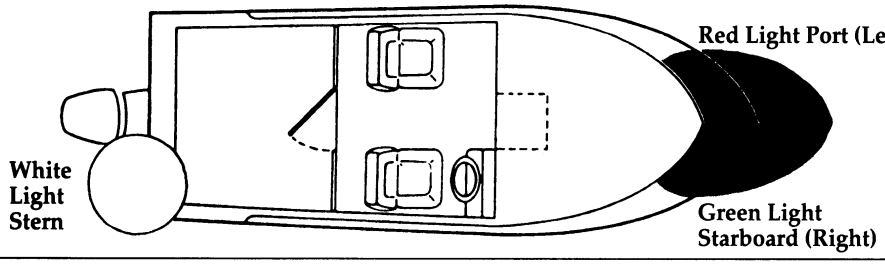


figure 1

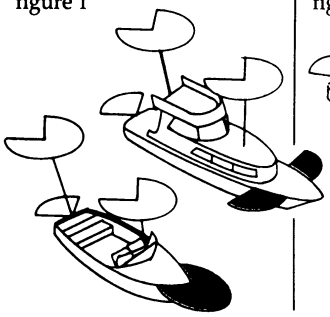


figure 2

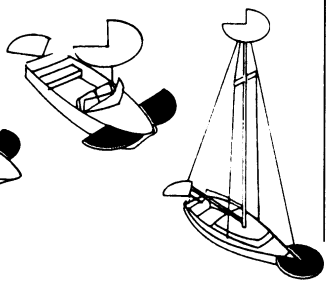


figure 3

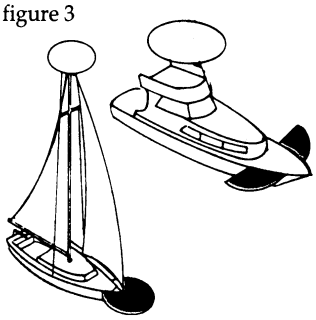


figure 4

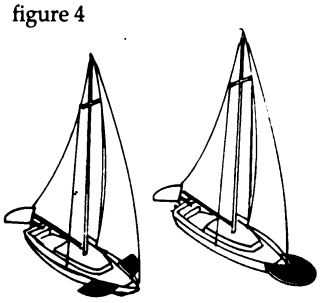


figure 5

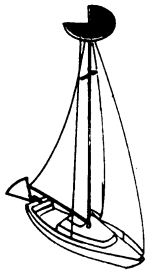


figure 6

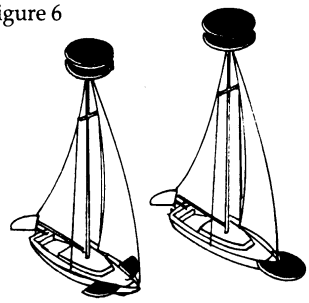
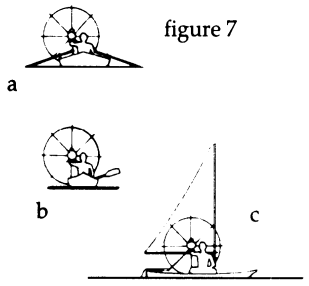


figure 7

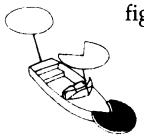


Sailboat using sail alone, less than 7 meters in length: If impractical to display lights in figure 4, 5 or 6, a single white light may be displayed in time to prevent a collision (figure 7c).

Row Boats or Paddle Boats
One all-round white light ready to display in time to prevent a collision (figure 7 a or b).

Great Lakes

figure 7d



Motorboat or sailboat using power on Great Lakes: The lighting arrangements in figure 7d may be used instead of the arrangements in figures 1 and 2.

Location of lights on vessel	Visible Range: Less than 12 m.	Visible Range: 12 m. but less than 20 m.	Degrees of arc lights
	in miles		
Masthead	2	3	225°
All-round	2	2	360°
Side lights	1	2	112.5° each color
Stern light	2	2	135°

Boats less than 12 meters in length
Motorboats or sailboats using power: The lighting arrangements to figure 1, 2 or 3 may be used.
Sailboat using sails alone: The lighting arrangements in figure 4, 5 or 6 may be used.

Boats 12 meters but less than 20 meters in length
Motorboats or sailboats using power: The lighting arrangements to figure 1 or 2 may be used.
Sailboat using sails alone: The lighting arrangements in figure 4, 5 or 6 may be used.

Location of lights
Lights should be located as shown in the drawings.
The masthead light (forward white light in figures 1, 2 and 7d) must be at least one meter higher than the colored lights on a boat less than 12 meters in length and at least 2.5 meters above the gunwale on a boat 12 meters but less than 20 meters in length.

Exceptions
Motorboat or sailboat using power, built before December 24, 1980: The lighting arrangement in figure 1, 2 or 3 may be used. However, the arrangement in figure 3 is not acceptable on a boat that is 12 meters or longer on international waters.

POLLUTION REGULATIONS

NOTICE

DISCHARGE OF OIL PROHIBITED

THE FEDERAL WATER POLLUTION CONTROL ACT PROHIBITS THE DISCHARGE OF OIL OR OILY WASTE INTO OR UPON THE NAVIGABLE WATERS AND CONTIGUOUS ZONE OF THE UNITED STATES IF SUCH DISCHARGE CAUSES A FILM OR SHEEN UPON, OR DISCOLORATION OF THE SURFACE OF THE WATER, OR CAUSES A SLUDGE OR EMULSION BENEATH THE SURFACE OF THE WATER.

VIOLATORS ARE SUBJECT TO A PENALTY OF $5,000

MARPOL TREATY

The USCG now enforces the International Convention for the Prevention of Pollution from ships, referred to commonly as the MARPOL TREATY (marine pollution). This international treaty prohibits the overboard dumping of all oil, garbage, ship-generated plastic and chemicals. There is a placard on board your boat (typical example shown below) that explains the garbage and plastic dumping laws in detail.

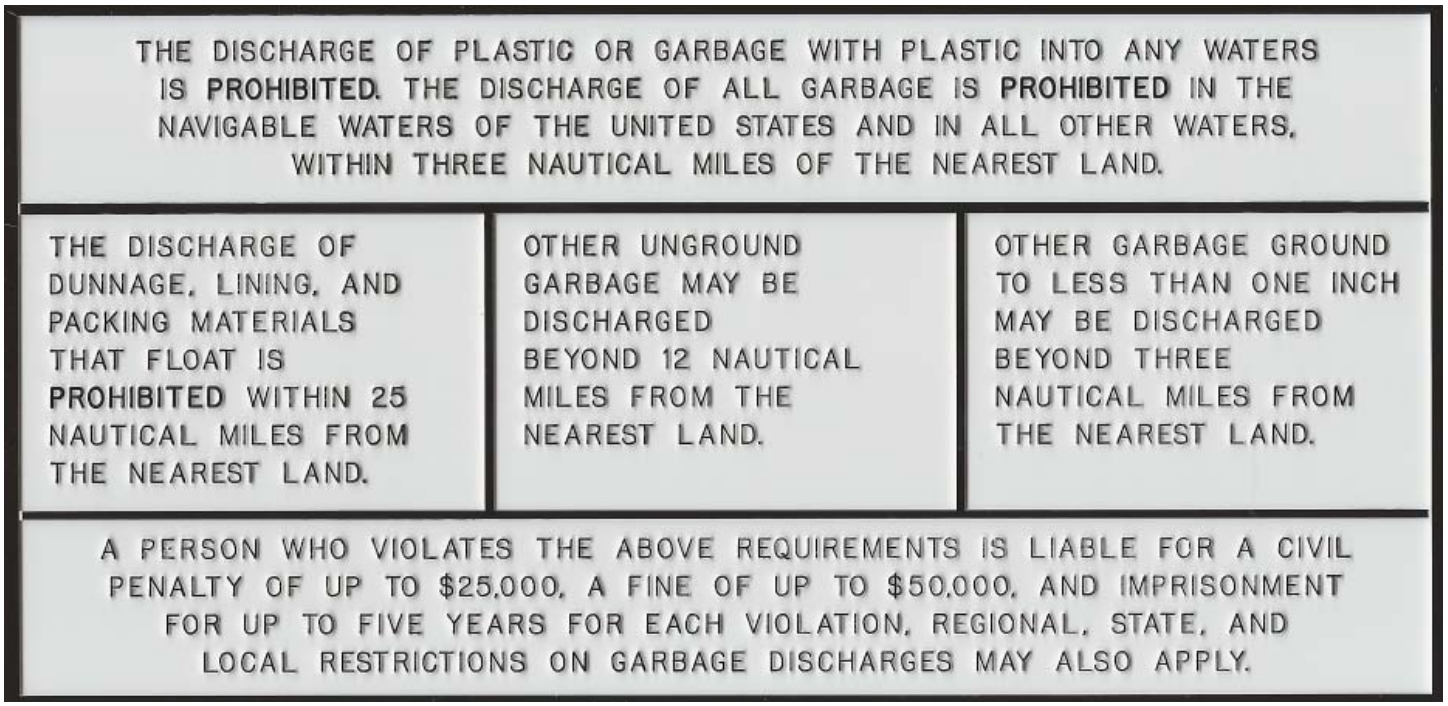
Immediately notify the USCG if your vessel discharges oil or hazardous substances in the water. Call toll free 1-800-424-8802. Report the following information: location, source, size, color, substances and time observed.

No vessel may intentionally drain oil or oily waste from any source into the bilge of any vessel. A bucket or bailer is suitable as a portable means of discharging oily waste.

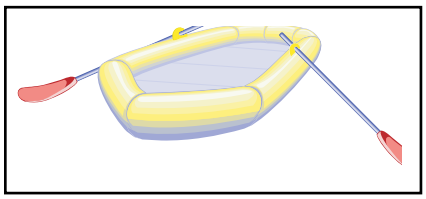
The placard noted above is normally located in the engine or may be attached to the engine hatch.

GARBAGE DISCHARGE

The act to prevent pollution from ships places limitations on the discharge of garbage from vessels. It is illegal to dump **plastic trash** anywhere in the ocean or navigable waters of the United States. Also, it is illegal to discharge **garbage** in the navigable waters of the United States, including the Great Lakes. The discharge of other types of garbage is allowed outside certain specified distances from shore as determined by the nature of that garbage. United States vessels of 26 feet or longer must display in a prominent location, a durable placard at least 4" x 9" notifying crew and passengers of discharge restrictions. USA vessels of 26' or longer equipped with a galley and berthing must have a written Management Plan describing the plan for collecting, processing, storing and discharging garbage, and designate the person charged with carrying out the plan.
The placard noted below is usually found under the galley or the cockpit refreshment center.


THE DISCHARGE OF PLASTIC OR GARBAGE WITH PLASTIC INTO ANY WATERS IS PROHIBITED. THE DISCHARGE OF ALL GARBAGE IS PROHIBITED IN THE NAVIGABLE WATERS OF THE UNITED STATES AND IN ALL OTHER WATERS, WITHIN THREE NAUTICAL MILES OF THE NEAREST LAND.
THE DISCHARGE OF DUNNAGE, LINING, AND PACKING MATERIALS THAT FLOAT IS PROHIBITED WITHIN 25 NAUTICAL MILES FROM THE NEAREST LAND.
OTHER UNGROUND GARBAGE MAY BE DISCHARGED BEYOND 12 NAUTICAL MILES FROM THE NEAREST LAND.
OTHER GARBAGE GROUND TO LESS THAN ONE INCH MAY BE DISCHARGED BEYOND THREE NAUTICAL MILES FROM THE NEAREST LAND.
A PERSON WHO VIOLATES THE ABOVE REQUIREMENTS IS LIABLE FOR A CIVIL PENALTY OF UP TO $25,000, A FINE OF UP TO $50,000, AND IMPRISONMENT FOR UP TO FIVE YEARS FOR EACH VIOLATION. REGIONAL, STATE, AND LOCAL RESTRICTIONS ON GARBAGE DISCHARGES MAY ALSO APPLY.

LIFE RAFTS



Inflatable life rafts are recommended for ocean going and vessels operating in a large body of water like the Great Lakes. They provide a shelter for extended periods. If used, make sure it is large enough for all aboard and contains the proper emergency equipment pack. Also, periodically have the unit professionally serviced. Make sure the life raft is Coast Guard approved since it would require meeting a number of stringent material and performance standards.

USCG MINIMUM EQUIPMENT REQUIREMENTS

Use the chart below as a guideline for assuring your vessel is outfitted to meet USCG standards. Remember to check with local and state authorities for additional equipment requirements. Make sure your vessel certificate of numbers are on the boat, updated and displayed properly according to state requirements. Keep the paperwork on board in a watertight and safe environment. Make sure it is quickly accessible.

On documented vessels keep both the original and current certificate on board stored in a safe, dry, and accessible location. Also, on documented vessels make sure the vessel name/hailing port are marked on the hull exterior with letters not less than 4" in height. In addition, the Official Number must be permanently affixed on a clearly visible interior structure part of the boat-block type Arabic numbers not less than 3" in height.

USCG Minimum Equipment Requirements for Recreational Vessels

Boat Size in Feet	16'	26'	40'	65'	165'
Personal Flotation Devices[1]	One Type I, II, III, or V per person		One Type I, II, III, or V per person plus one Type IV throwable		
Fire Extinguishers[2]					
No Fixed System	One B-I, any type		One B-II or Two B-I	One B-II and one B-I, or three B-I	One or more B-II (vessels 0-50 tons gross) Two or more B-II (vessels 50-100 tons gross)
With Fixed System	No Portables Required		One B-I	Two B-I or one Class B-II	
Visual Distress Signals	Night signals required when operating at night		Minimum of three day-use and three night-use (or three day/night combination) pyrotechnic devices[5]		
Sound Producing Devices	Horn or whistle recommended to signal intentions or signal position			One bell, and one whistle or horn required to signal intentions or position	
Backfire Flame Arrestor	One CG-approved device on each carburetor of all gasoline-powered engines built after April 1940, except outboard motors				
Ventilation	CG standard system required on gasoline powered vessels with enclosed engine compartments built after August 1980				
Navigation Lights					
Under Power[3,4]	Sidelights, Stern Light and Masthead[6,7]				
Under Sail	Sidelights and Stern Light[6,8]				
Rowing	Same as "Under Sail"				
At Anchor	All-round light, 2nm (at night) or black anchoring ball (during the day) when outside a designated anchorage				
Visibility Range	1nm Sidelights, 2nm all others			3nm Masthead, 2nm all others	5nm Masthead, 2nm all others
Pollution Regulations	"Honor system" (no plaques required)		5" x 8" Oil Discharge placard and 4" x 9" Waste Discharge placard Vessels over 40' with a galley must have a Waste Management Plan		
Marine Sanitation Devices	Vessels with installed toilet facilities must have an operable, CG-certified Type I, II or III Marine Sanitation Device (MSD). **Subject to local laws!**				Type II or III MSD only
Navigation Rules	Familiarity with the Inland Navigation Rules required			The Inland Navigation Rules ("Rules of the Road") must be kept on board	

1. *Pfd's must be CG approved, wearable by the intended user and readily accessible.*
2. *Fire extinguishers required on boats with enclosed engine compartments (not outboards), enclosed living spaces or permanent fuel tanks.*
3. *Sailboats operating under engine power are considered power driven and must follow the "Under Power" rules. During the day, motorsailing vessels are required to fly a motoring cone.*
4. *Power-driven vessels under 23' and under 7 knots can substitute a white lantern or torch in place of the required lights.*
5. *Non-pyrotechnic substitutes: 1 orange distress flag (day-use) and 1 electric SOS signal light (night-use).*
6. *All boats under 65' can substitute a single bi-color light for sidelights.*
7. *Boats under power under 40' can substitute a single all-round light for separate stern and masthead lights.*
8. *Boats under sail under 40' can substitute a tri-color light for separate sidelights and stern light.*

Additions to theses requirements are prescribed by some individual state laws. Check your state's Boating Safety Handbook for a complete list.

EXHAUST & CARBON MONOXIDE

Carbon monoxide (CO) in exhaust can be hazardous. especially from gasoline engines, gasoline generators, grills, stoves, space heaters and on a much smaller degree diesel engines.

CO is a natural by-product of the gasoline engine using an artificial spark . Diesels on the other hand detonate fuel using pressure and temperature. Looking at the two engines another way, gasoline engines use much more oxygen up in the combustion process which contributes to a much higher CO build-up. Although diesels do produce a small amount of CO the combustion process operates with much greater amounts of oxygen which the end result is a much lower CO level.

In conclusion, even though your yacht may use diesel propulsion ensure that you read the information and follow all the recommendations regarding CO as if it were gasoline powered.

Familiarize your crew, passengers and yourself with the sources, symptoms and possible effects of carbon monoxide poisoning. Remember that boats in the same general vicinity can cause your vessel to accumulate dangerous CO levels in the cabin and or under the hardtop operating with the above conditions and sources.

For safety sake avoid the following:

1. Do not park by other boats with their engine idling or generator cycling for an extended period of time .
2. Do not disable the carbon monoxide alarms that come with your Regal boat. Test the units in accordance with the alarm manufacturers instructions.

3. Do not operate an engine for extended periods of time while in a confined area or where exhaust outlets face a sea wall or bulkhead.

4. Do not operate the engine for an extended period of time with the canvas in the upright and installed position.

5. Have the engine exhaust system inspected when the boat is in for service.

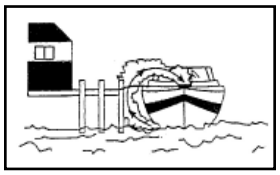
6. Persons sleeping can easily be overcome by carbon monoxide without realizing it. Do not sleep on board while an engine or generator is running close-by.

7. Do not operate your vessel for extended periods with the bow up in slow cruise conditions especially close behind a vessel being towed or one operating at slow speeds.

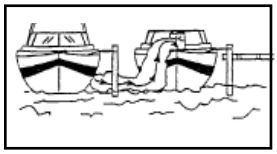
8. When underway open all hatches, windshield vents, and main cabin entry door to allow proper airflow from bow to stern.

WARNING

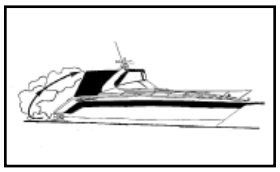
AVOID SERIOUS INJURY OR DEATH
FROM CO POISONING!
DO NOT OPERATE THE BOAT WITH PEOPLE
HOLDING ON TO THE SWIM PLATFORM
OR WITH PEOPLE IN THE WATER.



Blockage of exhaust outlets can cause carbon monoxide to accumulate in the cabin and cockpit area even when the hatches, windows, portholes and doors are open. Sea walls and other confined spaces can cause CO levels to be dangerously elevated.



Exhaust from another vessel alongside your boat, while docked or anchored, can emit poisonous CO gas inside the cabin and cockpit areas of your boat.



The "station wagon effect" or backdrafting can cause CO gas to accumulate inside the cabin, cockpit/hardtop or bridge areas when the boat is under-way, using protective weather coverings (canvas), high bow angle, improper or heavy loading, slow speeds, or at rest. This can occur when traveling behind another boat.

How does CO affect us?

In high concentrations, CO can be fatal in minutes. However, the effects of lower concentrations over a extended period of time can be just as lethal.

Our blood uses hemoglobin to carry the oxygen we breathe to different body parts. Unfortunately, hemoglobin carries CO more readily than it does oxygen. The result is when we breathe in CO it replaces oxygen in our blood and we begin to suffocate. Also, when we are removed from the CO source it remains in our blood for hours causing long term effects. People have been known to become sick and even lose consciousness hours after exposure.

Carbon monoxide accumulation requires immediate attention! Thoroughly ventilate cabin and cockpit areas. Determine the probable source of the carbon monoxide and correct the condition immediately. Anyone with symptons of CO poisoning should be placed in a fresh air environment and medical attention found immediately. Regal has installed CO detectors on your boat. Have these detectors professionally calibrated at regular intervals according to the equipment manufacturer's recommendations.

A Few Notes About Diesel/CO Poisoning

The diesel engine under normal combustion produces much smaller amounts of CO. Therefore, it is far less likely to be fatal to a healthy person. Other factors including weather, temperature and engine condition can greatly affect the unsafe build-up of CO. The **best** approach is to respect and treat the engine, generator and other vessel components the same way you would a gasoline propulsion system giving particular attention to the sources and possible effects of CO poisoning!

Diesel exhaust in the combustion process produces various components and the captain must be aware that the build-up of these select components over a period of time can cause CO or seasickness like symptoms.

These include carbon dioxide, carbon monoxide (CO), nitrogen dioxide, nitric oxide, sulfur dioxide and others.

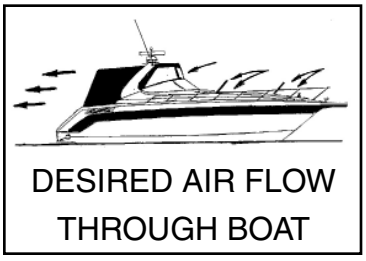
A healthy person breathing in sulfur dioxide over a period of time through a diesel engine or generator exhaust can develop nausea. This condition is not life threatening but the person may exhibit CO poisoning or seasickness symptoms. Just never rule out that it could be CO poisoning! Immediately find the source of the problem and move the individual to a fresh air environment!

Symptoms of excessive exposure to carbon monoxide (CO) are:

- Dizziness
- Drowsiness
- Nausea
- Headache
- Ringing in the ears
- Throbbing temples
- Watering, itchy eyes
- Flushed appearance
- Inattentiveness
- Incoherence
- Fatigue or vomiting
- Convulsions

DANGER

CARBON MONOXIDE IS A TASTELESS, ODORLESS AND INVISIBLE GAS THAT CAN CAUSE DISCOMFORT, SEVERE ILLNESS, AND EVEN DEATH. EXERCISE CAUTION WHILE OPERATING GENERATOR OR ENGINES IN CONFINED SPACES OR AT DOCKSIDE. DO NOT ALLOW HULL EXHAUST OUTLETS TO BECOME BLOCKED OR EXHAUST FUMES CAN BECOME TRAPPED IN AND AROUND THE CONFINES OF YOUR BOAT. DURING IDLE AND SLOW CRUISE CONDITIONS, BILGE BLOWERS SHOULD BE USED.



DESIRED AIR FLOW THROUGH BOAT

To help prevent carbon monoxide accumulation, ventilate your cabin and cockpit while underway. Open a forward hatch, porthole or window to allow air to travel through the boat's interior and cockpit. See the illustration for desired airflow.

WARNING

INSPECT THE EXHAUST SYSTEM. IMMEDIATELY REPAIR OR REPLACE LEAKING, CRACKED AND CORRODED, OR MISSING EXHAUST COMPONENTS.

- Before each trip inspect engine and generator.
- Make sure all exhaust hose clamps are in place and secure.
- Look for exhaust leaking from the exhaust system components, indicated by rust and or black streaking, water leaks, or corroded or cracked fittings.
- Inspect all rubber exhaust hoses for burned or cracked areas. All rubber hoses should feel soft and and be free of kinks.
- Visually verify that water exits at the engine exhaust outlet.
- Keep an ear tuned for any change in exhaust sound that could indicate an exhaust component malfunction.

DO NOT OPERATE THE VESSEL IF ANY OF THE ABOVE CONDITIONS EXIST. CONTACT A MARINE PROFESSIONAL!

NOTICE

CARBON MONOXIDE PRECAUTIONARY LABELS ARE LOCATED AT THE HELM, TRANSOM AND CABIN.
ENSURE THAT ALL ABOARD READ AND UNDERSTAND THE SIGNS AND EFFECTS OF CARBON MONOXIDE (CO).

CARBON MONOXIDE DETECTORS

Your Regal boat features designated sleeping accomodations along with galley sink and head compartments. Select vessels feature gasoline for propulsion and a gasoline generator. On these vessels a CO detector must be installed.

With diesel propulsion and diesel generation a CO detector is not required but "common sense" tells us we need to have them installed on board. They are standard equipment on your Regal diesel yacht. Mooring by boats running gasoline generators along with vessels using gas cooking/grilling/heating devices could lead to dangerous levels of carbon monoxide on your boat. Always be aware of other vessels mooring close to you especially if you are staying on board overnight. Read the owner's manual and vendor information regarding the CO detectors installed on your vessel.

Follow the periodical service recommendations per the vendor regarding recalabration of the carbon monoxide detector. Never attempt to repair a CO detector yourself. Get to know the signs of carbon monoxide poisoning. **Remember that carbon monoxide (CO) is known as the silent killer.**

TYPICAL CO DETECTOR

At Least Annually

To be performed by a marine professional:

☑ Replace exhaust hoses or mufflers if any evidence of cracking, charring or deterioration is found.

☑ Replace the engine water pump impeller along with the plate and housing if necessary. This will help prevent cooling system and exhaust system overheating.

☑ Inspect each of the metallic exhaust components for cracking, rusting, leaking or looseness. Pay detailed atttention to the exhaust manifold, cylinder head, water injection elbows.

BOATING & ALCOHOL

WARNING

FEDERAL LAWS PROHIBIT OPERATING A VESSEL UNDER THE INFLUENCE OF ALCOHOL OR DRUGS. THESE LAWS ARE VIGOROUSLY ENFORCED BY ALL ENFORCEMENT AGENCIES.

Operating a vessel while intoxicated became a specific federal offense effective in 1988. The ruling set federal standards for determining when an individual is intoxicated. If the blood alcohol content (BAC) is .10% (.08 in some states) or higher for operators of recreational vessels being used only for pleasure are subject to a civil penalty up to $1,000 or criminal penalty up to $5,000, one year imprisonment or both. In some states the fines and imprisonment may increase significantly.

The effects of alcohol and drugs account for the highest single cause of marine accidents and deaths. Most deaths in boating accidents occur when someone falls into the water. Balance is one of the first things you lose when drinking alcohol or under the influence of drugs. The problem arises out of not knowing your balance is restricted.

Overall vision is reduced by alcohol especially at night, along with double or blurred vision. Peripheral vision is lessened which restricts seeing vessels or objects on the side. Also, color awareness decreases especially with red and green which happen to be the colors of boat navigation lights, buoys, and channel markers.

Alcohol will greatly increase your heat loss so it increases the effects of hypothermia. Finally, your ability to make correct judgements in emergency situations is greatly reduced. Alcohol takes away the brains ability to process information quickly and delays a persons reaction time.

Don't drink and drive!

ALCOHOL MYTHS AND FACTS

Myth: Beer is less intoxicating than other alcoholic beverages.

Fact: One 12 oz. can of beer has about the same amount of alcohol as a 5oz. glass of wine or a shot of liquor.

Myth: Black coffee, fresh air, and a shower will sober the effects of alcohol.

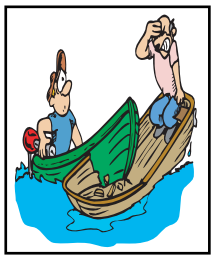
Fact: After consuming alcohol time is the only thing that will sober you up. Our bodies average burning 1 oz. of alcohol every hour. If a person is drunk, it will take a person seven or more hours to sober up.

Myth: Telling if a person is too drunk to operate a vessel is easy.

Fact: Many experienced drinkers have learned to compensate for the visual effects of alcohol and can disguise their drunk condition.

Myth: You can judge if you are fit to operate a boat.
Fact: Judgement is one of the first elements you lose when drinking.

BOATING ACCIDENTS



The following is a list of common causes of boating accidents. Be aware of them and take the necessary steps to ensure that yourself and crew are educated and prepared to act in an emergency.

1. Mixing boating and alcohol. Remember, the skipper is responsible for his crew, passengers and vessel.

2. Trying to reach the bow by the deck walk-around at unsafe speeds. Use the center walk-through.

3. Someone sitting on the bow, deck, or swim platform while underway.

4. Choosing a boating outing day with inclement weather, especially in high winds and thunderstorms in the forecast or staying out when bad weather is approaching.

5. Disembarking without checking all the fluids or systems, and especially fuel system components.

6. Not monitoring the boating traffic or possible obstructions around you.

7. Emergency communications equipment, signaling devices, and navigation lights not working.

8. Improper boat handling especially high speed turns in rough water. Using trim improperly.

9. Being too far from shore with inadequate fuel supply or navigational aids.

10. Passengers, especially children that are not wearing the proper life saving devices.

11. Skipper or passengers not seated in the boat.

REPORTING BOATING ACCIDENTS

According to the Federal Boat Safety Act of 1971 involving collision, accident or other casualty, the operator must make a formal report within 48 hours to the nearest state boating authority when the incident involves:

1. Death
2. Injury requiring treatment other than first aid
3. The disappearance of someone from a boat under death or injury circumstances.

A formal report must be made within 10 days for accidents involving more than $2000 damage or complete loss of vessel.

For information regarding accident reporting, plaease call the **Boating**

Safety Hotline at 800-368-5647.

If there is no state provision for reporting boating accidents a report must be made to the Coast Guard officier in charge, Marine Inspection Unit nearest to the accident site or USCG station.

RENDERING ASSISTANCE

The operator of a vessel is obligated by law to provide assistance that can be provided safely to any individuals in a dangerous situation on the waterway. The operator is subject to fine and or imprisonment for failure to do so.

DANGER

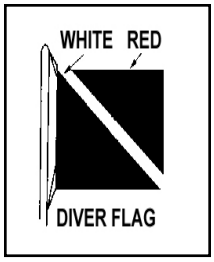
AVOID BODILY INJURY OR DEATH FROM FALLING OVERBOARD.
ALL OCCUPANTS SHALL STAY SEATED IN THE COCKPIT WHILE THE BOAT IS RUNNING.

WATER SPORTS

Besides learning the safety precautions for safe boating, as well as understanding and knowing required rules and regulations, you are obligated to be particularly careful around other water sportsman, such as scuba divers, water skiers, wake boarders, and fisherman.

WARNING

AVOID SERIOUS INJURY OR DEATH!
DO NOT OPERATE THE BOAT
WITH PEOPLE IN THE WATER
ON TOP OR HOLDING ON TO
THE SWIM PLATFORM STRUCTURE.



Whenever you see a "Diver Down" flag, maintain a distance of at least 100 feet on inland waters. In bays and open waters stay 300 feet away. The flag indicates a diver in the water. If a diver is operating from your boat, be certain to use this flag and post a lookout on board to observe the diver's air bubbles.

SWIM PLATFORM

On integrated or extended swim platforms you should make periodic inspections of the swim ladder and hardware that supports the platform to ensure that all connections and fittings are tight and in good condition.

Use heed when operating the boat in reverse to insure that water does not accumulate excessively on the platform or transom, especially in rough seas or strong currents. Do not exceed the platform recommended maximum capacity label! **Typical** label shown.

WARNING!
MAXIMUM CAPACITY
OF SWIM PLATFORM
500 POUNDS
226 KG

Read and understand the following warning label regarding "teak surfing."

Most boaters fish from time to time. With the propulsion systems of today it is possible to fish in out-of-the-way places. When crusing, stay clear of fisherman. They may have lines or nets out which might be cut or get caught in your propeller if you come too close. Slow down when approaching fishing boats. Do not return to cruising speed until the boats have been passed. If a fishing boat should be anchored, a large wake could flip or swamp the boat, upset fishing gear, pull the anchor loose from the bottom or worse yet cause someone to fall overboard.

When fishing from your boat, never anchor in a shipping channel or tie up to any navigational aid. These must be kept clear of at all times.

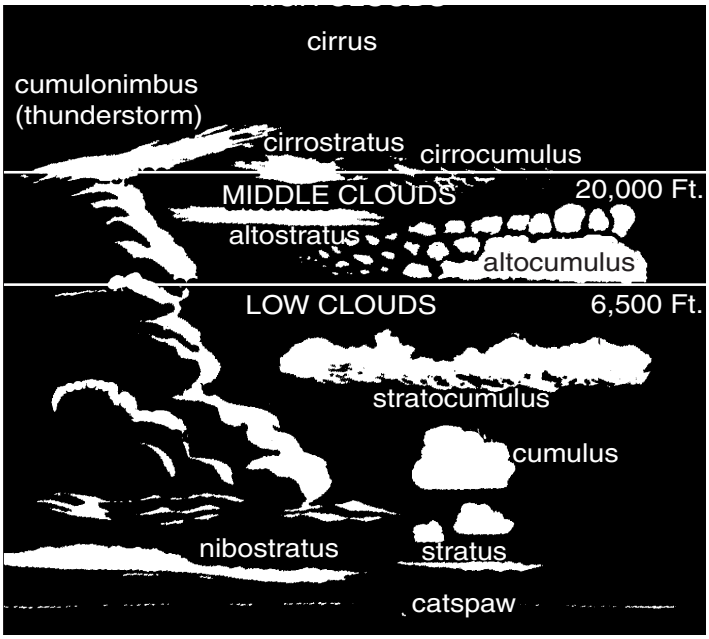
Be sure to carry a local chart of the area to back up your plotter and be on the lookout for shallow water and hidden obstructions. Many times local conditions change and there is a time lag on the plotter chip until the next revision. Pick up a tidal chart if appropriate so you do not end up grounded.

WEATHER/WATER CONDITIONS

Before a boating outing check the weather conditions. As we all know the weather can change rapidly in many parts of the country. It does so sometimes without being predicted. NOAA weather radio reports are continuously available on designated frequencies installed on VHF radios and various handhelds. Also, many local radio stations carry weather reports along with on-line information.

CLOUD FORMATIONS

Clouds indicate the type of current weather and upcoming changes in the weather. Knowing the type of cloud formation can assist you in understanding current weather. Flat clouds (stratus) normally indicate stable air. Cumulus clouds indicate unstable air. Many times a "cottonball" or cumulus cloud builds vertical height in the afternoon and the result is a thunderstorm with increased winds and waves; sometimes these storms are quite violent. Also, water spouts with high vortex winds can develop over water. You can find additional weather information (meteorology) at your local library or on the internet.



WAVES & FOG

As the wind blows across water waves are created. The stronger the wind and increased distance across the water enlarges the wave action.

Other factors that can cause problem situations for vessels are fog, currents, and tidal changes.

Fog can develop inland on clear, calm mornings. Coastal areas see large "blankets" of fog roll in and stay for extended time periods sometimes causing hazardous navigation conditions. If you are caught in the fog, do not panic. Think of the best plan of action and proceed carefully. If you are limited in navigation equipment at the first sign of fog proceed to the nearest shoreline and wait until the fog lifts.

Boats equipped with navigation equipment, local waterway experience and charts should proceed to a safe harbor. Use extreme caution, signal as needed, and reduce to a speed where you can stop within half of your forward vision range.

If foul weather catches you at sea do the following:

1. Slow down. Proceed with caution and put on your life vests.

2. Try to reach the nearest safe shoreline.

3. Navigate your vessel slowly into the waves at a 45 degree angle.

4. Passengers should sit low in the center of the vessel.

5. Monitor your bilge pump. Make sure sump stays free of water.

6. Secure loose gear. Make ready emergency equipment.

7. If the engine stops, throw the anchor over the bow. If needed use a sea anchor. Never anchor off the stern.

Rules Of The Road

NAVIGATION RULES DEFINED

The Navigation Rules set forth actions to be followed by boats to avoid collision. They are referred to as the "Rules of the Road". There are two main parts referred to as the inland and international rules. The inland rules apply to vessels operating inside the boundaries of the United States. The international rules (referred to as 72 COLREGS) apply to vessels operating on the high seas and all connected waters outside the established demarcation boundaries. Most navigational charts show the demarcation lines by red dotted lines and are published in the navagation rules. Remember to consult state and local agencies since areas such as "no wake zones," swimming beaches, "diver down flag" and inland landlocked lakes fall under their juristriction. This section is only an introduction to the "rules of the road". We strongly recommend additional training before getting behind the "wheel" of your boat.

⚠ WARNING

TO AVOID INJURY AND DEATH
FOLLOW THE NAVIGATION "RULES OF THE ROAD" TO PREVENT COLLISIONS.

You can order the Inland & International Navigation Rules from:

Superintendent of Documents
U. S. Government Printing Office
Washington, DC 20402
Tel: (202-512-1800) Fax:(202-512-2250

NAVIGATION RULES

RIGHT OF WAY

1. Cross waves at right angles.

2. When caught in heavy water or squalls, head either directly into the waves or at a slight angle. Reduce speed, but maintain enough power to maneuver your boat safely.

3. Keep your speed under control. Respect the rights of other boaters engaged in all water sports. Give them plenty of operating room.

4. Whenever meeting a boat head on, keep to the right where possible.

5. When two boats cross, the boat to the right (starboard) has the right of way.

6. When overtaking or passing, the boat being passed has the right of way.

In general, boats with less maneuverability have right-of-way over more agile craft. The skipper must keep his craft clear of the following vessels:

• A vessel not under command or aground; due to their circumstances, these vessels have no maneuverability.

• A vessel restricted in its maneuverability; these vessels usually are performing work which limits their maneuverability. Examples are boats surveying, dredging, laying pipe or cable, or servicing navigational markers.

• A vessel engaged in fishing; these include boats fishing with lines, trawls or nets, but not trolling lines.

• Sailboats; they have the right-of-way over powerboats. However, if a sailboat is using a prop to move forward, it is considered a powerboat even if the sails are up.

• Remember the unwritten "rule of tonnage". Basically a smaller tonnage vessel should take every effort to avoid close quarters with a larger tonnage vessel. One way to accomplish this is to have a designated human lookout to "eyeball" the horizon for any developing collision course.

• Use defensive driving skills on the waterway just as you do on the roadway. The other vessel may not know the "rules of the road". Be alert and ready to take immediate action.

• If a collision course is unavoidable neither boat has the right of way. Both boats must react to avoid an accident according to the rules of the road.

LOOKOUTS

International and Inland navigation rules spellout the specifics of establishing a lookout. *A lookout is legally defined by the court system as a person who has specifically charged duties on board such as observing sounds, echoes, lights and any inhibitors to navigation with complete throughness as permitted by the circumstances.*

The term "specifically charged" means that the lookout has no other duties at that time that could prevent him from keeping a proper watch.

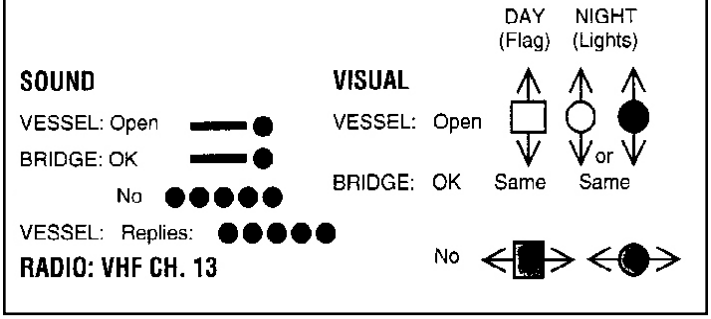
Of course the skipper must delagate the lookout duties to a seasoned crew member who can react to events quickly and communicate effectively with the captain with little notice.

As captain of your vessel you are responsible for the vessel and the crew. Choose an experiened individual as lookout and review the navigation rules with this person so he can make the right call quickly as situations develop.

WHISTLE SIGNALS

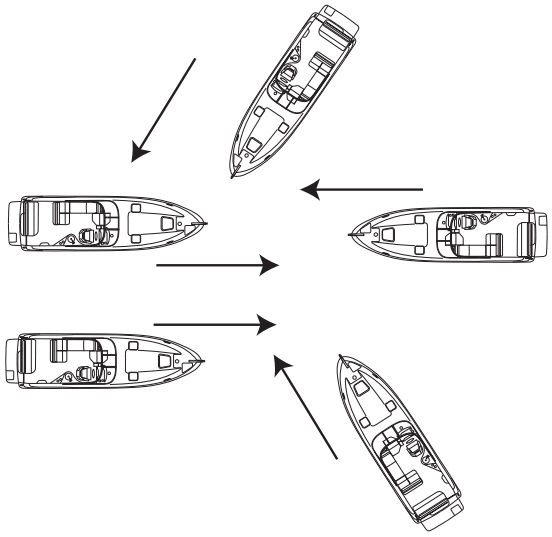
ONE LONG BLAST: Warning signal (Coming out of slip)
ONE SHORT BLAST: Pass on my port side
TWO SHORT BLASTS: Pass on my starboard side
THREE SHORT BLASTS: Engine(s) in reverse
FOUR OR MORE BLASTS: Danger signal

BRIDGE SIGNALS

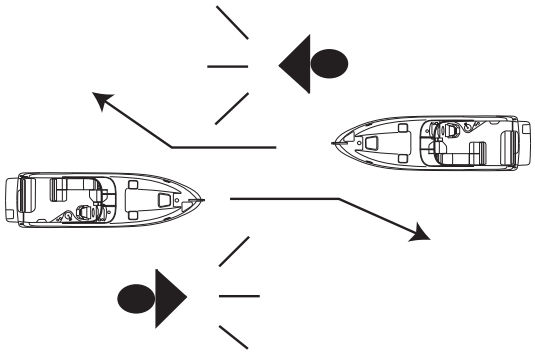


NAVIGATION RULES

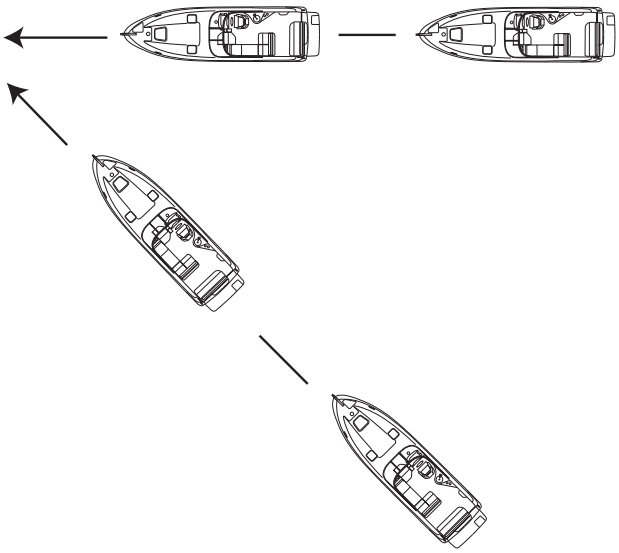
The Navigation Rules set forth 3 types of crossing situations- crossing, meeting, and overtaking. In each case, both boats are governed by special procedures.



In a head-on meeting, both vessels must sound a single blast to give way toward starboard and pass to port.

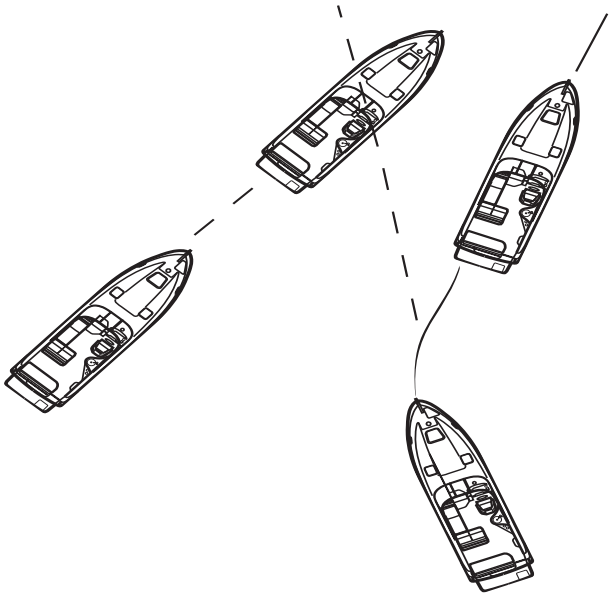


These rules appear when there is a risk of collision. In a crossing situation be aware of the other craft's position. For safety, there should be a noticeable change in the angle, bow or stern; a gradual change in position indicates possible danger.

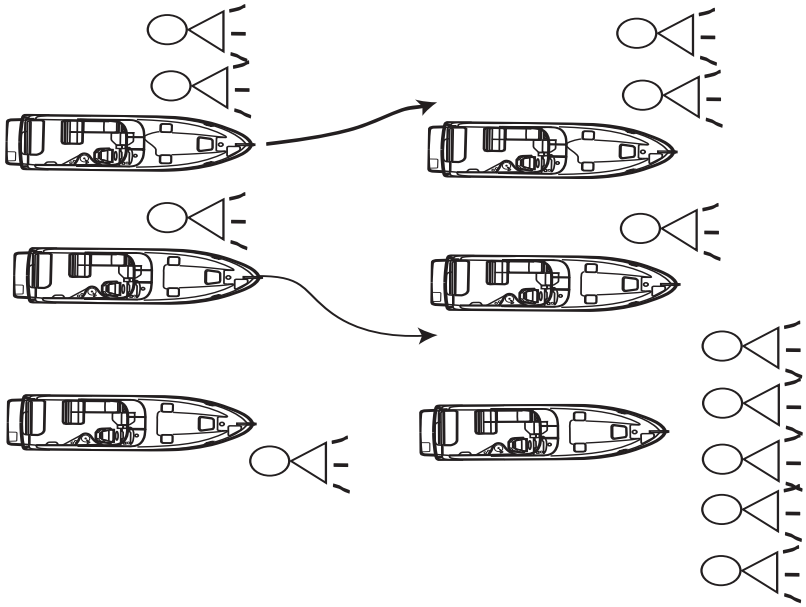


NAVIGATION RULES

An overtaking boat is burdened, and is not the priveleged craft, even though it approaches the danger zone of the overtaken boat.



The overtaking boat first signals with a single blast if that boat desires to pass on the starboard side of the boat ahead, or a double blast if passing to port. The overtaken craft responds with the same signal if safe, or with the danger signal (5 short blasts or more) if unsafe. The boat overtaking must not pass unless the appropriate signals are sounded.



NAVIGATION AIDS

Navigation aids are placed along coasts and navigable waters as a guide for mariners in determining their position in reference to land and hidden danger. Each aid provides specific information. They form a continous system of charted markers for monitoring on the plotter or providing accurate piloting on paper as a backup.

Your on board plotter provides up to date navigation aids. Besides coastal maps a complete domestic interior waterway grid is featured on the plotter.

If desired, there are hand-held GPS devices that are available as back-up devices. In addition, nautical charts are provided by the National Ocean Service (NOS) and are distributed nationwide through marinas and outlet stores. These charts show the geography of the coast, water depth, landmarks, navigation aids (buoys and markers), marine hazards, and port facilities. Use only up-to-date charts for navigation. We recommend when purchasing a chart to look for the weather resistant ones.

Buoys provide a roadmap to keep the skipper on course and to avoid hazards. Buoys are identified by light, shape, color and in severe weather conditions by sound.

Buoys or beacons called lateral markers indicate the port and starboard sides of the waterway to be followed. U. S markers follow the buoyage system known as Red Right Returning. When returning from sea or traveling upstream, the green markers are to port (on your left) and the red markers are to the starboard side (on your right). When traveling downstream or out to sea the marker color would be reversed.

Before operating your vessel, learn to identify the various navigational aids such as lateral aids, mid-channel markers, information and regulatory markers.

NOTICE

SKIPPERS MUST NOT RELY ON BUOYS
ALONE TO MARK THEIR POSITION.
SEVERE WEATHER CONDITIONS
AND WAVE ACTION CAN ALTER
A BUOYS POSITION.
NEVER TIE UP TO A BUOY.
IT IS ILLEGAL AND DANGEROUS.

LATERAL AIDS

Port Side
Odd Numbers

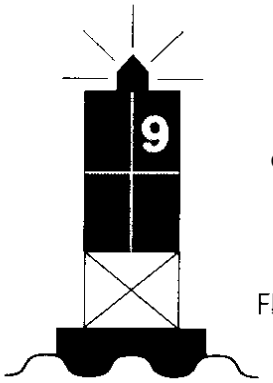


Chart Symbol

G "9"
Fl G 4 sec

Lighted Buoy
(Green Light Only)

Starboard Side
Even Numbers

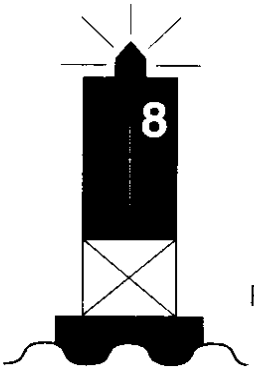


Chart Symbol

R "8"
Fl R 4 sec

Lighted Buoy
(Red Light Only)

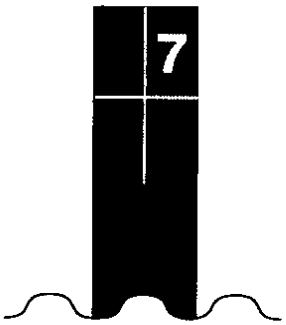


Chart Symbol

C "7"

Can Buoy
(Unlighted)

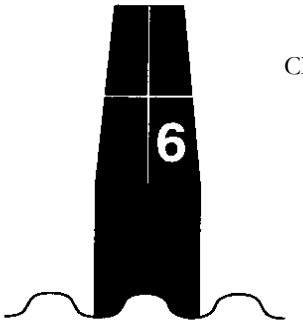


Chart Symbol

N "6"

Nun Buoy
(Unlighted)

-Chart Symbol

G "1"

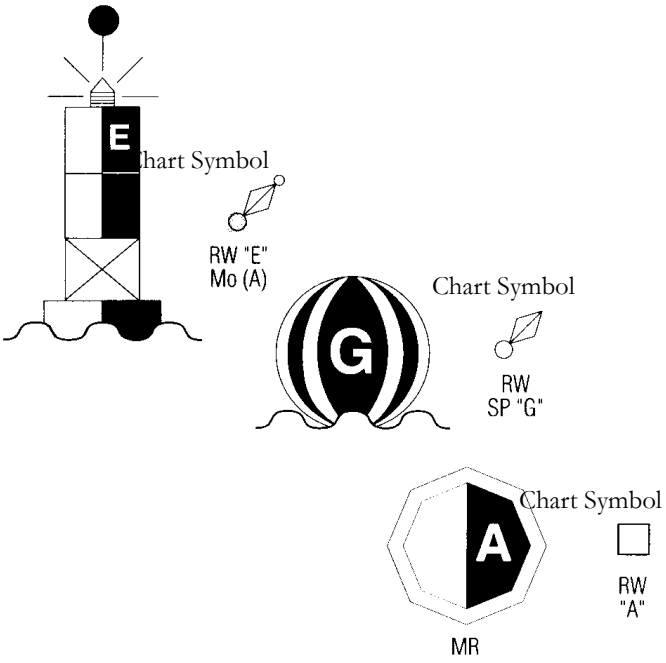
Daymark

Chart Symbol

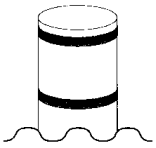
R "2"

Daymark

MID-CHANNEL MARKERS



REGULATORY MARKERS



Diamond Shape
Warns Of Danger

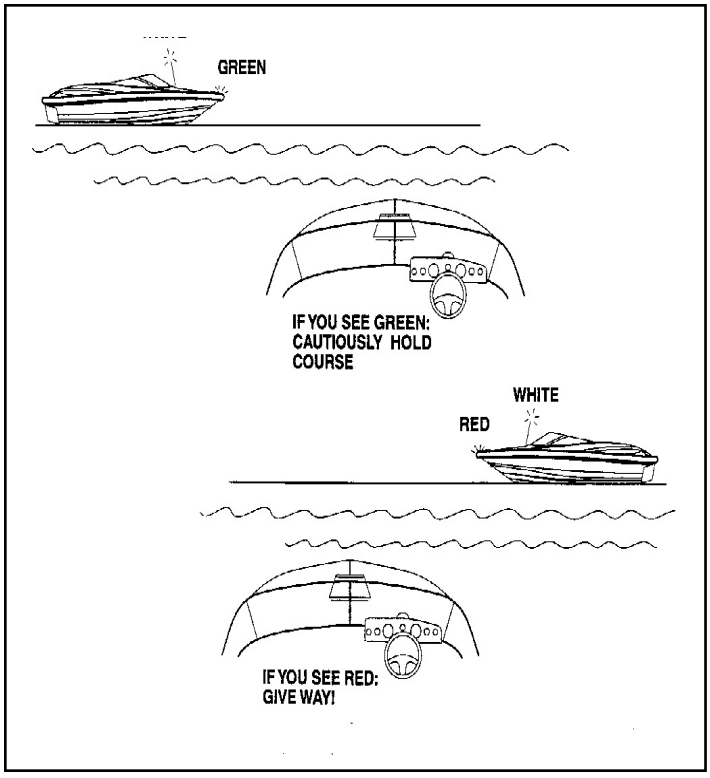
Diamond Shape With Cross-
Boats Keep Out

Circle Marks Area Controlled
As Indicated

For showing information such as locations,
distances and directions

NIGHT RUNNING

Boats operating between sunset and sunrise (hours vary by state), or in conditions of reduced visibility, must use navigation lights. Night time operation, especially during bad weather and fog, can be dangerous. All Rules of the Road apply at night, but it is best to slow down and stay clear of all boats regardless of who has the right-of-way.
To see more easily at night, avoid bright lights when possible. Also, it is helpful to have a passenger (appoint as lookout) keep watch for other boats, water hazards and navigational aids.
To determine the size, speed and direction of other vessels at night, you should use the running lights. A green light indicates starboard side, and a red light indicates port side. Generally, if you see a green light, you have the right-of-way. If you see a red light, give way to the other vessel.

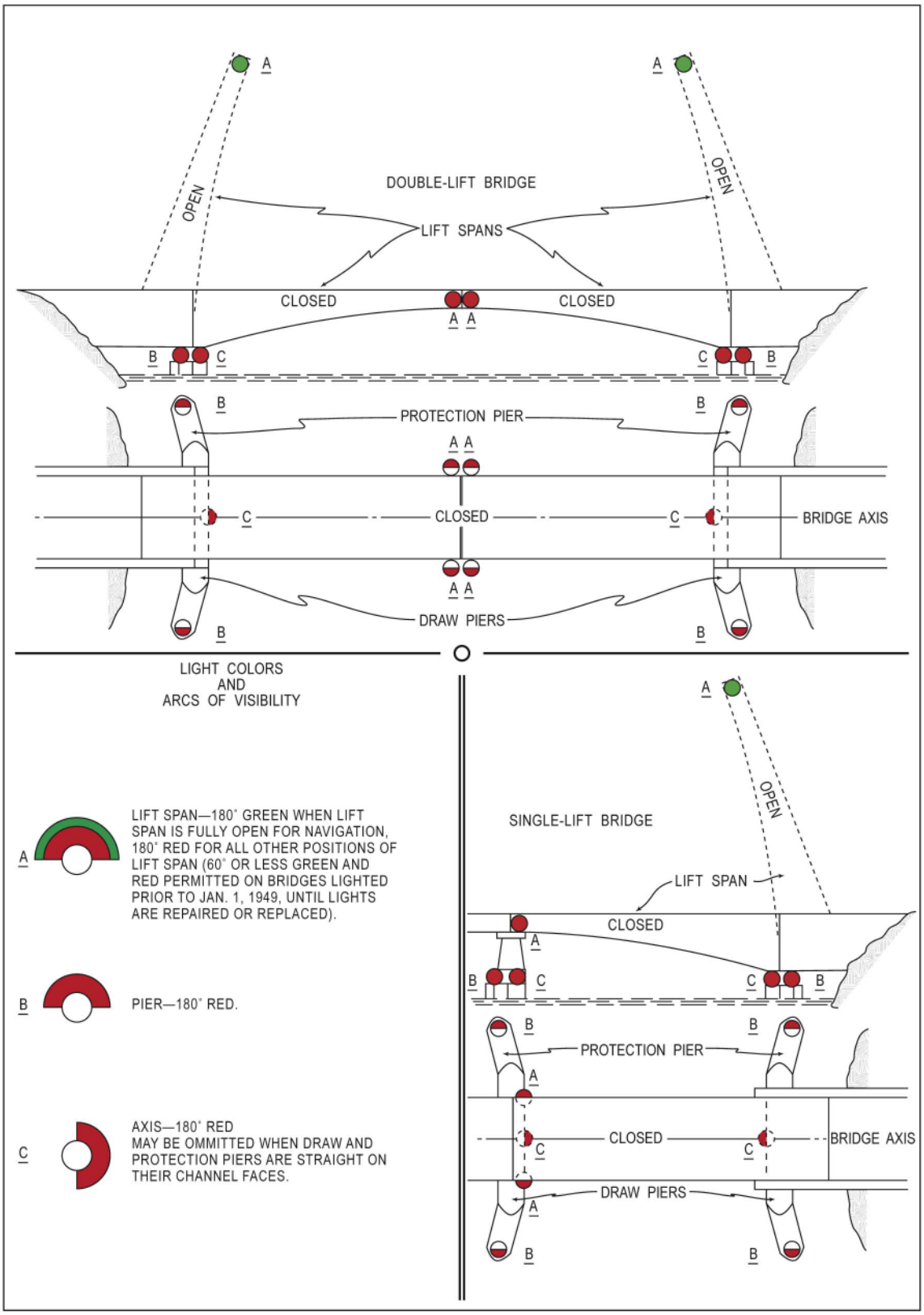


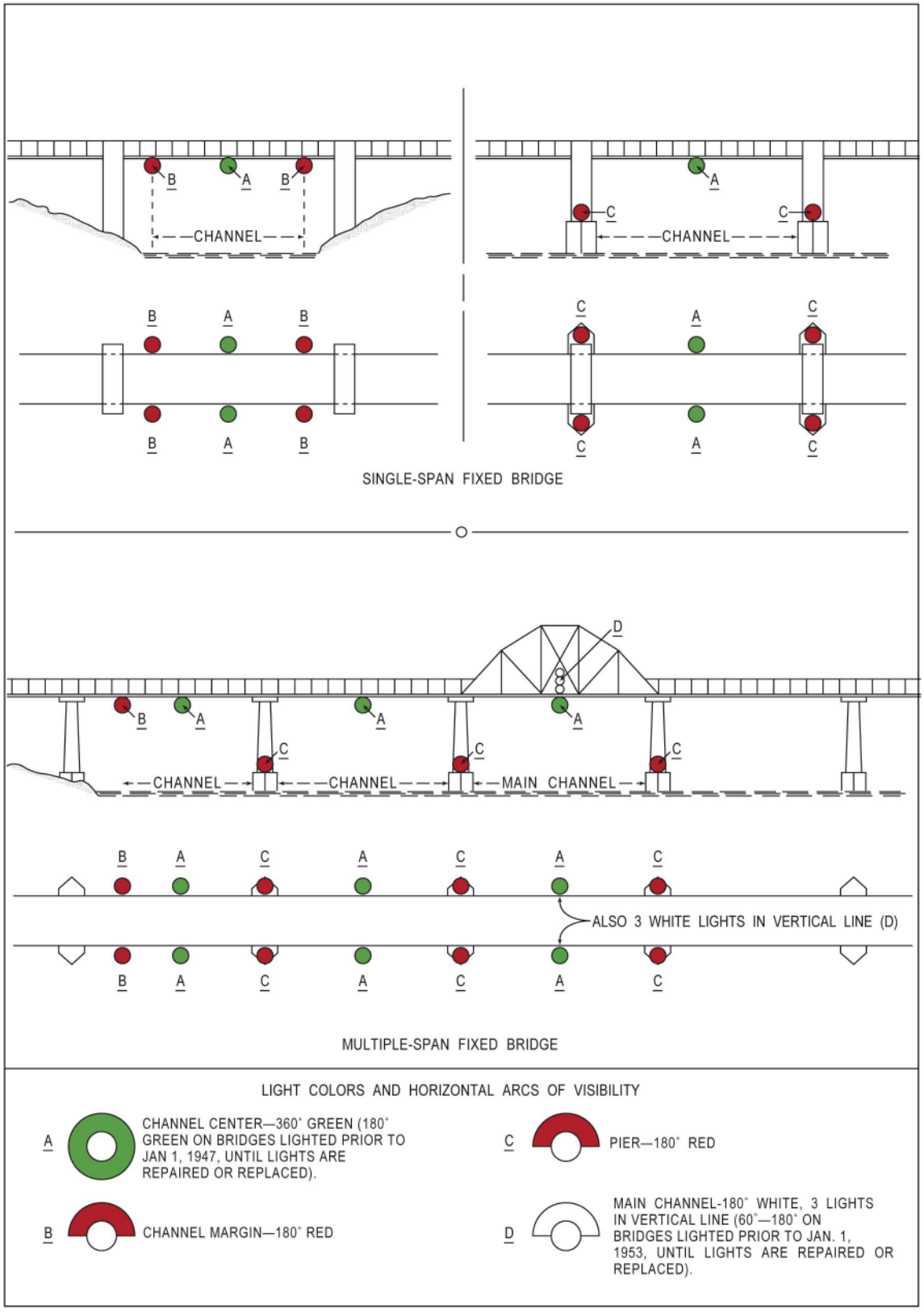
BRIDGE CLEARANCE

Be aware that your vessel requires a specified bridge clearance height. This height is a measured estimate from the waterline to the top of the highest equipment height. The estimated height can change because of variances in the loaded condition of the vessel and equipment variances. Consult the bridge clearance specifications located in Chapter 12 (Technical Information section).
Some bridges are tendered. Know and use the proper bridge signals when approaching these bridges (see bridge signals in this chapter). You can also monitor and communicate on channel 13 of a VHF radio for bridge information in most domestic locals. Other bridges are marked with a clearance measurement and you are on your own. It is recommended that you have a look out posted for additional visual assistance when entering a bridge zone.
After determining your vessel will clear the bridge proceed with caution at a safe idle speed. Keep your eye on vessel traffic at all times in order to react quickly. Keep both hands on the helm since you may need to change course because of current and wind conditions. Resume a safe speed once clear of the bridge structure and acknowledgment of clear visibility.
Just use common sense around any type of bridge structure!

BRIDGE LIGHTING

Bridge lighting is maintained by the Department of Homeland Security. On the following pages are 2 typical examples of night-time bridge lighting. As the skipper approaches bascule and fixed bridges light position (arc of visibility) and color will indicate the safe channel through the bridge. Notice green denotes the "safe" entry location on single-span bridges and green or white on multiple-span bridges designates the main channel. In addition, green denotes the "up" position for single and double lift bridges.


DOUBLE-LIFT BRIDGE
LIFT SPANS
OPEN
OPEN
CLOSED
CLOSED
A A
B C
C B
PROTECTION PIER
B
B
A A
C
CLOSED
C
BRIDGE AXIS
A A
DRAW PIERS
B
B
LIGHT COLORS
AND
ARCS OF VISIBILITY
A
LIFT SPAN—180° GREEN WHEN LIFT SPAN IS FULLY OPEN FOR NAVIGATION, 180° RED FOR ALL OTHER POSITIONS OF LIFT SPAN (60° OR LESS GREEN AND RED PERMITTED ON BRIDGES LIGHTED PRIOR TO JAN. 1, 1949, UNTIL LIGHTS ARE REPAIRED OR REPLACED).
B
PIER—180° RED.
C
AXIS—180° RED
MAY BE OMMITTED WHEN DRAW AND PROTECTION PIERS ARE STRAIGHT ON THEIR CHANNEL FACES.
A
SINGLE-LIFT BRIDGE
OPEN
LIFT SPAN
CLOSED
A
B C
C B
B
B
PROTECTION PIER
A
A
C
CLOSED
C
BRIDGE AXIS
A
DRAW PIERS
B
B


B
A
B
CHANNEL
A
C
C
CHANNEL
B
A
B
B
A
B
C
A
C
C
A
C
SINGLE-SPAN FIXED BRIDGE
D
B
A
A
A
C
C
C
CHANNEL
CHANNEL
MAIN CHANNEL
B
A
C
A
C
A
C
ALSO 3 WHITE LIGHTS IN VERTICAL LINE (D)
B
A
C
A
C
A
C
MULTIPLE-SPAN FIXED BRIDGE
LIGHT COLORS AND HORIZONTAL ARCS OF VISIBILITY
A
CHANNEL CENTER—360° GREEN (180° GREEN ON BRIDGES LIGHTED PRIOR TO JAN 1, 1947, UNTIL LIGHTS ARE REPAIRED OR REPLACED).
B
CHANNEL MARGIN—180° RED
C
PIER—180° RED
D
MAIN CHANNEL-180° WHITE, 3 LIGHTS IN VERTICAL LINE (60°—180° ON BRIDGES LIGHTED PRIOR TO JAN. 1, 1953, UNTIL LIGHTS ARE REPAIRED OR REPLACED).

Systems

OVERVIEW

In this chapter the Regal on board systems are introduced. Information includes several main systems including fuel, electrical, air conditioning (AC), windlass, water, waste, electronics, entertainment, and trim tabs. This is the "meat and potato" section for equipment operation.
A system description, location of components, operational information along with common problems and solutions are covered with the system equipment components.

Be sure to read and follow any danger, warning, or caution labels in reference to the vessel's systems or individual equipment components.
Your Regal boat may not contain all of the equipment or systems shown. **Regal has the right to modify, update or delete equipment and/or systems at anytime.**
Refer to the vendor documentation located in the owner's information packet for more detailed information of individual yacht system components.

Note: In some instances typical photos and descriptions are utilized as illlustrations of components, equipment and general operating principles.

FUEL SYSTEM INTRODUCTION

In this section, the basic fuel system components are introduced. The fuel system includes the fuel tank, fuel supply, fuel selector valves, fill and vent fittings along with fuel filters and the ventilation system.
Fuel in general today is processed in a different manner than it was a few years ago. Ethanol usually made from corn has been added to gasoline. As a result gasoline has become more unstable and the product shelf life has been shortened.
As part of product features the engines and the transmissions feature a fault handling system should a malfunction develop. A portion of this fault system is used to monitor the fuel system.

Select codes warn the captain with a "buzzer" sound while others will display on the helm tachometer, display, or alarm panel. The "pop-up" will alternate between the cause of the fault and a task to perform to aid in eliminating the situation.

It is important to read and understand your propulsion owner's manual in order to react to a fault code should a malfunction display on the instrumentation or an alarm sound.

Note that both Volvo and MerCruiser units used on select vessels in the United States contain certified fuel components that comply with EPA EVAP standards.

The fuel tank selector valve system regulates the fuel being delivered via the fuel tanks. It allows you to change from one tank to another for fuel tank equalization. There is a generator fuel selector valve when a generator option is installed. The generator fuel selector valve would be another item to monitor in the fuel usage equation when the generator is running.
See the **auxiliary equipment chapter** *for further information on the fuel selector valve system.*

WARNING

PREVENT INJURY, DEATH,
OR PROPERTY DAMAGE!
READ AND UNDERSTAND
THE PROPULSION OWNER'S MANUAL
BEFORE ATTEMPTING
TO OPERATE THE VESSEL.

TYPICAL FUEL SYSTEM

FUEL TANKS

The fuel tanks are located in the engine room. The illustrations below shows the various fuel tank fill, and feedhoses with connections to engines and generator. All items are accessible for periodic inspection by lifting the engine hatch.

Placed at the top of each fuel tank is a fuel sender. This device reads the amount of fuel remaining in the fuel tank and sends a signal to the fuel gauge located at the helm (dash). Periodically check the fuel sender for a loose connection especially the ground wire at the fuel tank. Always use the one-third rule with fuel. One-third for outbound cruising, one-third for inbound cruising, and the remaining one-third fuel supply for reserve.

OPTIONAL GENERATOR FEED ENGINE FEED

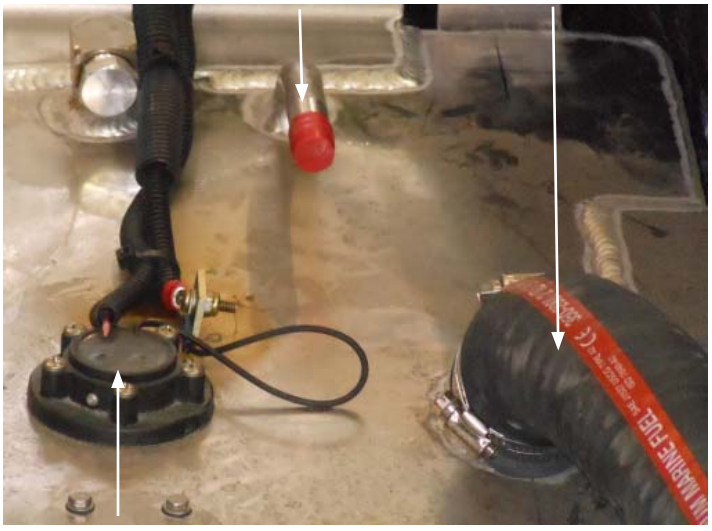
WARNING

PREVENT INJURY, DEATH, OR PROPERTY DAMAGE!
INSPECT THE FUEL SYSTEM PERIODICALLY FOR LEAKS, LOOSE CLAMPS OR FASTENERS.

GAS FILL DECK FITTING.

DECK GAS VENT FITTING.

VENT HOSE FITTING FUEL FILL HOSE



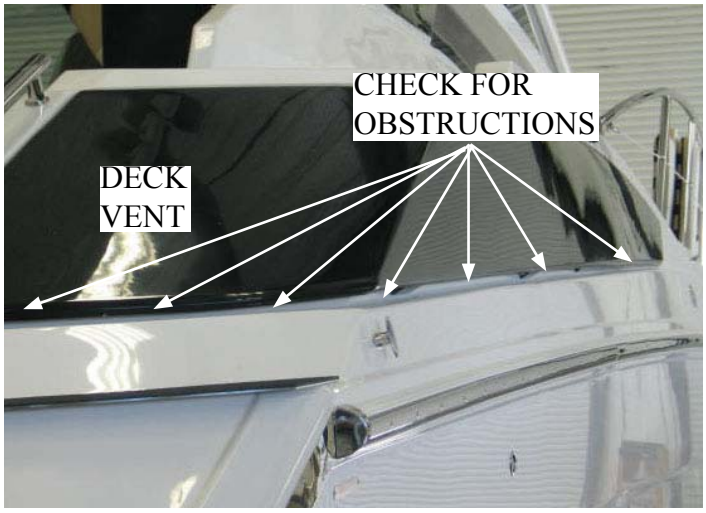
FUEL SENDER

TYPICAL VENTILATION SYSTEM

Engines require a continuous supply of fresh air in order to generate peak horsepower and rpm. To deliver fresh air for the engines a dual set of permanently mounted vents are integrated into the boat's deck on both port and starboard sides.

When the engines are started fresh air is drawn through the vent system. As the demand for air increases in relationship to the engine revolutions per minute (rpm's) the engine induction system supplies the required additional air supply by inhaling more air through the vents.

Check the vents periodically for any obstructions or foreign objects such as nests or spider webs. If the propulsion system is running at a lower than normal cruising rpm or seems to lack power or the vessel is slow to plane check the fresh air supply to the engines including the engine air filters.



The fresh air system outlined above is called natural ventilation.

In addition to the natural ventilation system a powered ventilation system is used on gasoline and select diesel engine propulsion unis. The powered ventilation uses an ignition protected blower motor and removes any dangerous fumes from the engine compartment bilge area through a set of attached hoses and emits the discharged air through vents to the atmosphere safely. Blowers need to run for at least 4 minutes before starting engines or generator and the blowers need to be activated below cruising speeds. Note that there is one blower motor per engine.

TYPICAL DUAL POWERED BLOWER SYSTEM

ELECTRICAL INTRODUCTION

In this section, basic DC (direct current) and AC (alternating current) electrical systems are introduced. Select electrical components are reviewed along with their location and function within the vessels electrical system.
For more complicated issues outside the scope of this manual contact your closet Regal dealer. They have undergone extensive training on Regal electrical systems.
Be sure to read and follow any danger, warning, or caution labels in reference to your vessel's electrical system or individual equipment components.

WARNING

PREVENT SEVERE INJURY OR DEATH!
DISCONNECT
ALL ELECTRICAL POWER SOURCES
BEFORE ATTEMPTING
TO REPAIR OR REPLACE
ANY ELECTRICAL COMPONENTS.

VIEW-MAIN DISTRIBUTION PANEL

DIRECT CURRENT (12 VOLTS)

Your boat uses 12 volt DC electricity otherwise known as direct current. It is called DC because it flows only one way in a circuit. Specifically helm gauges, batteries, battery cables, engine electrical components, engine wiring harnesses, dash switches, selected lighting, shower sump, bilge pumps, and vacuum toilets are all components using a 12 volt DC system.

In the DC system used in the United States the red wire is designated as the "hot" or conductor wire and the black wire is referred to as the ground wire. At times other current carrying wires are color coded such as blue to identify their use as a low voltage conductor. This is especially helpful in troubleshooting and adding additional equipment. Be sure to review the wiring schematics in the drawing section of the technical chapter.

Direct current is stored in the vessel's batteries and *produced* through the engine alternators while the engines are running or by the battery charger at dockside.

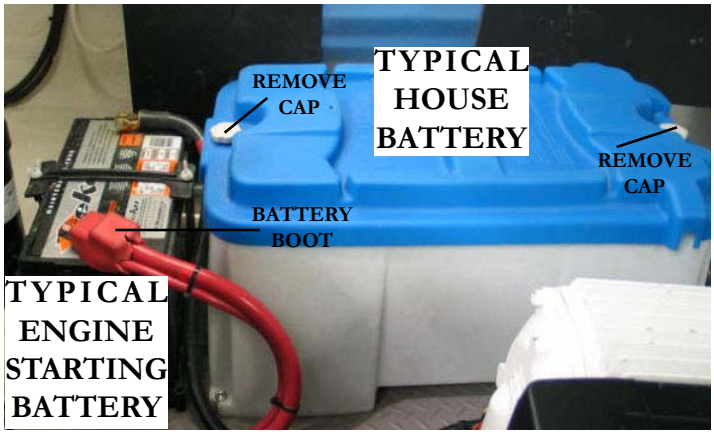
The alternators charge the batteries by sending current through the main distribution panel relays, battery switches and harnesses to the appropriate battery. Normal DC voltage is between 12 and 15 volts. Lower or higher readings could indicate a charging malfunction or a weak battery.

The engine alternators used on your vessel are internally self "excited" and produce DC current at idle.

Current specifications for Volvo alternator output is 115 amps. The IPS steering system needs additional operating current and this is one reason the alternator output is higher than conventional units.

BATTERY (12 VOLTS) DESCRIPTION

On board direct current is *stored* in the ship's "wet cell" batteries. There are 2 engine starting batteries and a deep cycle "house" battery.



BATTERY SPECIFICATIONS			
Battery Type	Group	CCA @32 Degrees F.	Reserve Capacity
Engine Cranking	31A	1260	195 min.
House	8D	1700	430 min.

BATTERY TERMINOLOGY

Group- Batteries are divided into groups which identify the height, length, and width of the battery. This is useful information should a replacement battery become necessary.

Cold Cranking Amps (CCA)- This rating measures the cranking power a full charged marine battery has available to start at 32 degrees F. Basically, the higher the rating the greater starting power of the battery.

Reserve Capacity (RC)- As usage on the boat increases so does the need for more reserve capacity. The reserve capacity represents the length of time in minutes a new fully charged battery can maintain the yacht's electrical needs without the engine running or in the event the alternator fails.

NOTICE

AS A SAFETY FEATURE
THE FORWARD AND AFT BILGE PUMP CIRCUITS ALONG WITH THE HIGH WATER ALARM ARE CONTINUOUSLY "ON" EVEN WITH THE UNIVERSAL BATTERY SWITCHES IN THE OFF POSITION.

POSSIBLE PROBLEMS/SOLUTIONS

1. Weak battery- This battery problem can be caused by low electrolyte cell levels. Warm, engine compartment temperatures will deteriorate a battery's life quicker by evaporating the water from the electrolyte, thus corroding and weakening the positive grids inside the battery.

With the house battery low electrolyte levels can be monitored by periodic inspection and filling as needed with distilled water. Boaters in higher climate areas with longer stretches of hot weather will need to check their batteries more often.

The "maintenance free" engine cranking batteries require no water. They do feature a different chemistry that does consume less water. Inside the cells as gases are released condensation is formed which aids in maintaining the cell electrolyte level. These batteries incorporate a deeper layer of electrolyte over the plates, but eventually it can run dry. On the 31 series engine cranking batteries keep all terminals clean, connections tight and your electrical system in top shape to extend the battery life.

2. **Dead Battery-** Either the battery will not accept a charge, hold a charge or the charging system is not supplying a charging current through the battery charging system and/or engine alternators.

The battery charger output can be checked by monitoring the lights on the charger front face.

To begin with check the battery post connections for tightness and corrosion.

With the engines running the displayed voltage of the port or starboard engine battery and house battery should be between 12.5 up to 14.6 volts. If less than 12 volts check for voltage across the battery terminals.

If less than 12 volts on the house battery use a hydrometer to locate faulty cells.

On maintenance free batteries they can be removed from the vessel if necessary and trickle charged. If readings after charging are still low replace the battery.

TYPICAL BATTERY CHARGER

The battery charger features 50 amp output and universal voltage for 3 battery circuits. This means that the battery charger will operate from 95 volts through 277 volts either at 50 or 60 Hz. This is helpful on docks that carry lower voltage. The new electronic battery chargers are "smart". They will charge the batteries in 3 stages; bulk, absorption, and float formats. The charger is designated to get the maximum life out of your batteries, using micro computer controlled charging.

It is recommended to keep the battery charger "on" at all times when AC power is available for maximum battery life. We recommend checking the battery water level weekly.

The charger is factory set to charge flooded lead acid batteries which are the most common type available. The charger can be reprogrammed to take gel cell or AGM batteries.

In the event the boat is switched over to different battery designs, it is important that **all** batteries are changed over to the same type.

Remember, changing to a different battery type requires re-programming the charger. Do not mix different designed batteries because they need different charging rates and voltages.

During bulk charge the battery charger brings up the battery charge state quickly, as the battery nears fully charged, it switches over to absorption charge. Absorption charges at a lower rate than bulk, until the battery is just a few % away from full charge.

The battery charger display includes functional LED information for charge current, charge voltage, charge phase (bulk, absorption, float), battery content measurement and/or battery condition measurement as a % of Ah capacity.

It is recommended that an ABYC certified electrical technician perform any repairs or service. Do not attempt to open the battery charger casing.

Refer to the vendor information for more detailed instructions.

WARNING

PREVENT INJURY, DEATH, OR PROPERTY DAMAGE FROM HIGH VOLTAGE! DISCONNECT THE AC POWER SUPPLY BEFORE ATTEMPTING TO BEGIN ANY BATTERY CHARGER SERVICE WORK.

TYPICAL BATTERY ISOLATOR

The battery isolator is located aat the firewall bulkhead beside the battery charger. The battery isolator is a solid state electronic device containing diodes which work in conjunction with the battery charger to keep each battery charged as needed. The diodes act as an electronic "gate" opening and closing as needed. When a battery is fully charged the gate closes and battery current will be routed to an open gate which is in fact one of the other batteries needing a charge. This cycle continues depending on which battery or batteries will need a charge.

Periodically check the isolator for loose connections and make sure each red "boot" in on its post securely. No other maintenance is normally required.

TYPICAL CHARGING SYSTEM- SUMMARY NOTES

Following is a summary regarding the vessel charging system or specific charging system components.

1. With the battery charger unplugged from shore power the battery charger is not generating any DC power. However, the battery charger is connected to the batteries through the battery switches. The 105 amp resettable breakers protect each battery circuit.
Remember that the charger is connected to the battery side of the switch and is continuously "hot".

2. There is a breaker protecting the battery charger circuit. A primary cause of the breaker to "trip" would be if the positive and negative battery cables were crossed. The above situation could easily happen if someone was trying to jump start a battery with "jumper cables." To a lesser degree should a wire delivering current from the battery charger chafe a fuse may "blow" and the battery charger would cease its charging operation. See your Regal dealer for ordering extra fuses for your charger.

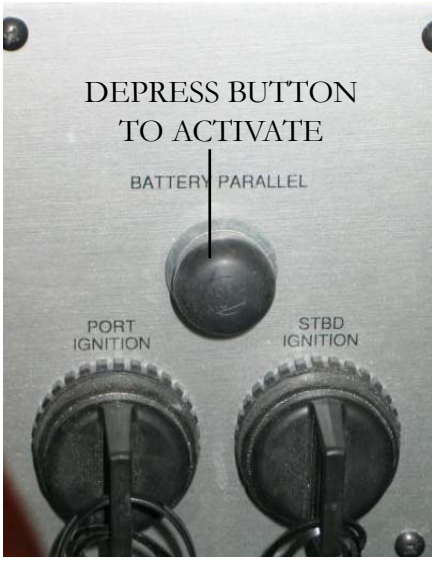
2. If one of the cranking batteries is weak or "dead" first start the generator up and let it run awhile as it will send an initial charge to the weak battery. Then engage the battery parallel switch to start the engine.

3. Always turn the universal battery switches on the DC battery switch panel to the "off" position when leaving the vessel for extended periods. Select breakers that control specific safety functions of the boat will operate as normal.

4. When leaving the vessel after connecting your dockside power cord turn the battery charger breaker at the management panel to the "on" position. This will permit the battery charging system to energize the appropriate batteries as needed.

6. An internal battery charger fuse protects the entire circuity from reverse connections. For example, if someone was attempting to "jump" start an engine and had the polarity reversed on the jumper cables this action may cause the internal fuse to "blow" thus making the charger inoperative.
Bottom line- always remove a battery from the vessel if using a trickle charger. It is not recommended to jump start using booster cables.

BATTERY PARALLEL SWITCH



The battery parallel switch is connected through the engine ignition switches to each of the engine cranking batteries. If one of the engine cranking batteries is weak this system will use the good battery from the one engine to provide cranking power for the weak battery of the other engine.

It is always recommended to let the weak battery recharge awhile before using the battery parallel switch. This can be done by using dockside power or by running the generator. This process will supply some initial charging energy to the weak battery. It is even more important to follow the above procedure if the battery is "dead."

To activate the battery parallel switch first start the engine with the charged battery. Let the engine run for a few minutes. Now depress the battery parallel button while simultaneously cranking over the weaker battery's engine. After the engine starts release the button mechanism.

TYPICAL ENGINE IGNITION SWITCH

HIGH WATER ALARM.
SPOTLIGHT CONTROL
HIGH WATER ALARM
SPOT LIGHT / DIRECTION
BLOWER SWITCH
WARNING!
GASOLINE VAPORS CAN EXPLODE. BEFORE STARTING ENGINE, OPERATE BLOWER 4 MIN. AND CHECK ENGINE COMPARTMENT FOR GASOLINE LEAKS OR VAPORS. RUN BLOWER BELOW CRUISING SPEED.
IGNITION SWITCHES
12 VOLT ASSY. PLUG
PORT ENGINE
STBD ENGINE
BATTERY PARALLEL
EXH BLOWER
BATTERY PARALLEL SWITCH

On select vessels dual ignition switches are used to crank over and start the engines. The left ignition switch controls the port engine and the right ignition switch controls the starboard engine.

Ignition switches normally feature 3 positions.

STOP- SPRING LOADED TO THE LEFT.

ON- SUPPLIES IGNITION POWER TO ENGINE.

START- SPRING LOADED TO THE RIGHT.
Each ignition switch features 3 positions.
Refer to the engine chapter for further information.

Note: See the engine operatior's manual for additional detailed information on ignition switches and starting engines.

WARNING

AVOID POSSIBLE BODILY INJURY OR DEATH!
REMOVE KEYS FROM THE IGNITION SWITCHES WHEN THE ENGINES ARE NOT RUNNING.

TYPICAL BATTERY SWITCH PANEL

The battery management system is an important ingredient of the vessel's 12 volt direct current (DC) system. The DC battery switch panel consists of 3 universal battery switches along with a 105 amp DC breaker for each battery switch.

The universal battery switch marked port is part of the port engine cranking battery circuit. The universal battery switch marked starboard is part of the starboard engine battery circuit. Likewise, the switch marked master is part of the "house" battery circuit. It is recommended that all battery switches be deactivated before leaving the vessel for extended periods.

⚠ WARNING

PREVENT POSSIBLE FIRE/EQUIPMENT DAMAGE!
NEVER TURN THE UNIVERSAL BATTERY SWITCHES TO THE "OFF" POSITION WHILE THE ENGINES ARE RUNNING.

TYPICAL D.C. DISTRIBUTION CENTER-OVERVIEW

The D.C. distribution center is located inside the engine room is normally mounted on the forward firewalll bulkhead. It provides circuit protection for major D.C.groups such as the dash, cabin, windlass, and electronics.
In addition, specific component circuits are protected. Following is a listing of each component and the resettable breaker size.

COMPONENT	BREAKER SIZE
Dash Main	80 Amps
Cabin Main	80 Amps
Windlass	90 Amps
Electronics	60 Amps
Aft Bilge Pump	8 Amps
Oil Changer	20 Amps
Alarm-Highwater	5 Amps
Stereo Memory	10 Amps
Fwd, Bilge Pump	8 Amps
Shower Sump Pump	2 Amps

TYPICAL D.C. DISTRIBUTION CENTER-COMPONENT BREAKER DESCRIPTION

DASH MAIN- protects dash operation switch functions, and engine hatch panel. In addition, it controls components located on the helm breaker sub-panel. Engine functions are not controlled by the dash main breaker.

CABIN MAIN- protects the cabin main DC panel which controls direct current switch functions throughout the vessel.

WINDLASS- protects the deck mounted anchor windlass circuitry.

ELECTRONICS- protects all electronic dash equipment components along with the stereo components. In addition, this breaker controls all breakers from the electronics through sirius weather on the helm breaker panel.

AFT BILGE PUMP- protects the aft bilge pump float switch circuitry located in the engine room.

HIGH WATER ALARM- protects the bilge high water alarm. This audible alarm sounds at the dash should bilge water reaches a predetermined level. Normally this would indicate large volumes of water are entering the bilge since normal amounts would be drawn overboard via the bilge pump system.

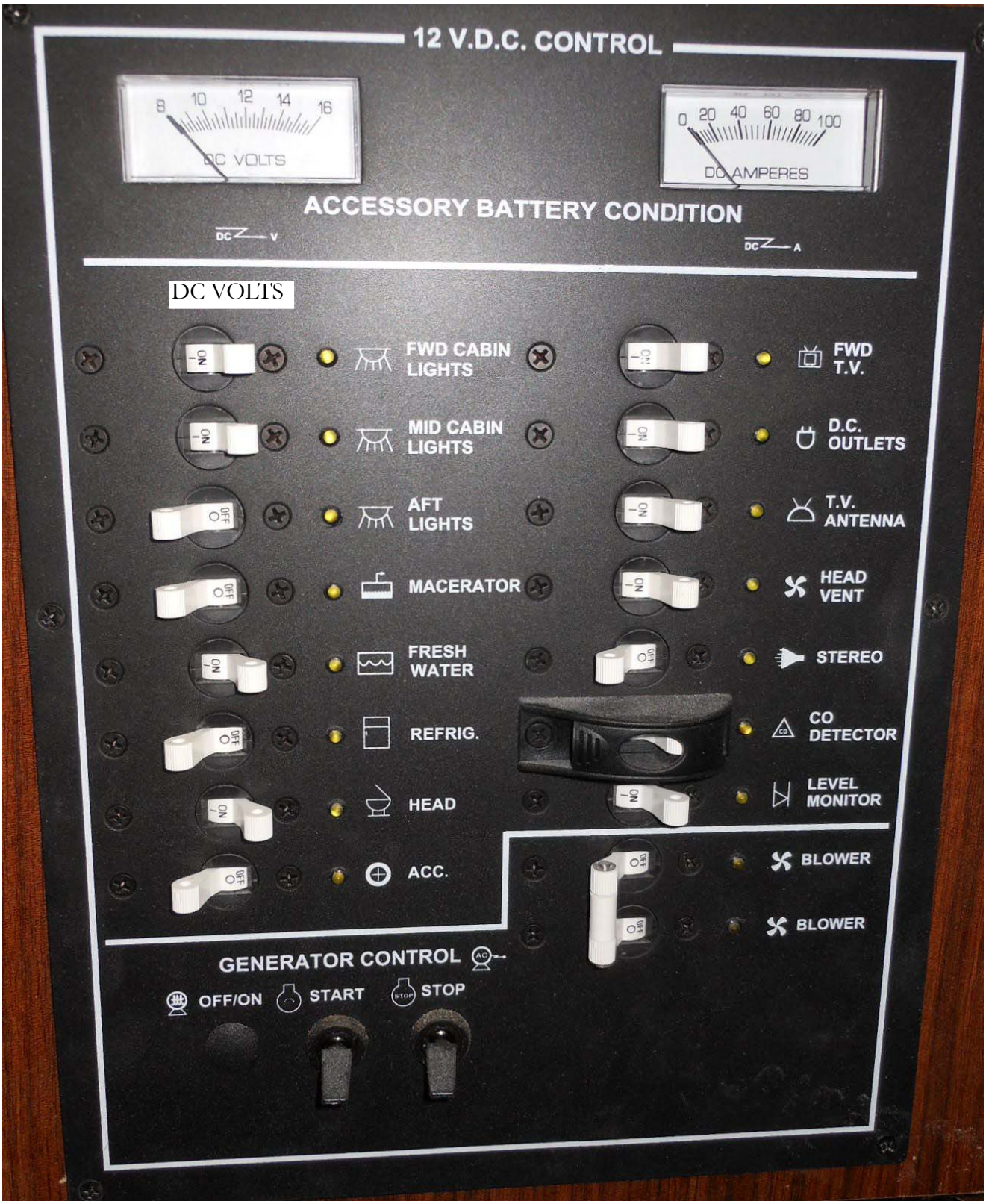
FWD. BILGE PUMP- protects the forward most bilge pump float switch circuitry.

OIL CHANGER- protects the engine and generator oil changer pump circuitry located in the bilge.

STEREO MEMORY- protects the stereo system memory circuit and the stereo unit itself.

SHOWER SUMP PUMP- protects the aft/forward shower sump pump circuitry.

TYPICAL MAIN DC PANEL METER/SWITCH FUNCTIONS



The typical main DC control panel is located in the aft starboard salon behind the overhead cabinet doors. This panel is protected by the cabin main breaker at the battery management center. The panel features an analog 12 volt DC volt meter and amp meter to monitor electrical flow and current. These 2 instruments can be valuable aids in basic electrical troubleshooting.

A triple generator switch cluster facilitates gen-set operations. A 3 amp in-line fuse located on the rear side of the panel protects the blue soft indicator icon for each breaker. Notice the CO covered breaker. This switch require a 2 step operation to actuate the component to prevent accidential tripping off the CO detectors. The cover must be lifted before the switch can be activated. For more information read the sections on carbon monoxide.

SHIP'S MAIN PANEL DC BREAKER DESCRIPTION (TYPICAL)

DC BREAKER TYPE	DC AMPERAGE	DC BREAKER TYPE	DC AMPERAGE
FWD. CABIN LIGHTS	15	FWD, TV	10
MID CABIN LIGHTS	15	DC OUTLETS	10
AFT CABIN LIGHTS	15	TV ANTENNA	3
MACERATOR	10	HEAD VENT	5
FRESH WATER PUMP	15	STEREO	10
REFRIGERATOR	20	CO DETECTOR*	3
HEAD	10	LEVEL MONITOR	3
ACC.	10	BLOWER	15
		BLOWER	15

* Note: To deactivate the CO detector breaker requires a 2 step process.

** Note: Your DC ship's main panel may show different breaker call-outs or use a different panel location.

TYPICAL 12 VOLT MAIN DC PANEL METER/BREAKER SWITCH FUNCTIONS

FWD. CABIN LTS- protects the overhead and reading lights.

MID CABIN LTS- protects the main cabin overhead lights.

AFT LTS- protects overhead and reading lights.

MACERATOR- protects the overboard discharge pump which when permitted pumps waste overboard.

FRESH WATER- protects fresh water system pump.

REFRIGERATOR- protects the main cabin refrigerator.

HEAD- protects the head electrical circuit.

ACC.- Normally is used for add-on components.

FWD. T.V.- protects the forwaard television set circuit.

D.C. OUTLETS- protects the 12 volt accessory plug outlets.

TV ANTENNA- protects the antenna mounted on the hardtop.

HEAD VENT- protects the head vent fan motor.

STEREO- protects the stereo circuitry.

CO DETECTOR- protects separately the 3 CO detectors located in the forward, salon and aft staterooms. To access these breakers first pull the cover up from right to left. At this point the breaker can be turned off. For protection purposes these breakers shall be left in the "on" position.

LEVEL MONITOR- protects the fresh water and waste tank monitor located near the salon main AC panel.

BLOWER- protects the engine/generator blower circuits.

TYPICAL 12 VOLT HELM BREAKER SUB-PANEL

The helm breaker sub-panel protects various equipment switches at the dash. It is located at the center helm under the steering wheel area. The sub-panel is controlled in part by the dash main breaker and the electronics breaker both located on the DC distribution center. In addition, various electronic controllers are found here.

The skipper should learn the location of all DC breakers on the vessel and the equipment they protect. For example, a breaker may trip on the sub-panel but may not trip the breaker at the DC Knowing his breaker location will aid the skipper in troubleshooting problems faster.
Remember, always find why a breaker "trips" before resetting it. Refer to the technical drawing section for additional information.

TYPICAL 12 VOLT HELM BREAKER SUB PANEL DESCRIPTION

FORE DECK LT.- protects the deck light circuit.

FWD. BILGE- protects the forward bilge pump circuit.

AFT BILGE- protects the aft bilge pump circuit.

NAV/ANCHOR- protects all navigation lights.

COCKPIT LTS.- protects the cockpit light circuit.

ARCH LTS.- protects the hardtop light circuit.

PANEL LTS.- protects the helm (dash) back-lit icons.

HELM SEAT- protects the helm seat's movement circuitry.

HORN- protects the air horn located on the hardtop

WINDSHIELD VENT- protects the fresh air windshield vents.

WIPER- protects the starboard windshield wiper circuit.

WINDLASS REMOTE- protects the deck mounted foot petals.

FUEL TRANSFER- protects the sump mounted transfer pump. Used for diesel installations.

12 VOLT- protects the accessory plug circuitry.

.

ACC.- protects any aftermarket equipment added by the owner.

ENGINE RM LTS.- protects the cockpit refrigerator circuit.

GAS VAPOR- protects optional gas vapor detector circuiitry.

ENGINE HATCH- protects the hatch opening mechanism.

STEREO MEMORY- protects the stereo memory circuit.

TRIM TABS- protects the transom mounted electric-hydraulic trim tab circuit.

SPOTLIGHT- protects the deck mounted light circuitry.

ACC.- protects any aftermarket equipment added by the owner.

VHF- protects the marine radio circuitry.

RADAR PLOTTER- protects the optional closed array radar circuitry.

GPS PLOTTER- protects the helm mounted GPS circuitry.

AUTO PILOT- not used.

DEPTH SOUNDER- not used.

ACC.- protects any aftermarket equipment added by the owner.

Note: Select equipment breakers are dedicated for optional equipment and may not be found on your boat.

12 VOLT HELM BREAKER SUB PANEL (TYPICAL BREAKER SIZE)

FORE DECK LT.- 10 AMP

FWD. BILGE- 10 AMP

AFT BILGE- 10 AMP

NAV/ANCHOR- 10 AMP

COCKPIT LTS.- 10 AMP

ARCH LTS.- 10 AMP

PANEL LTS.- 5 AMP

HELM SEAT- 10 AMP

HORN- 20 AMP

WINDSHIELD VENT- NOT USED

WIPER- 10 AMP

WINDLASS REMOTE- 5 AMP

FUEL TRANSFER- 25 AMP

12 VOLT- 25 AMP

ACC.- 5 AMP

ENGINE RM LTS.- 5 AMP

GAS VAPOR- 30 AMP

ENGINE HATCH- 5 AMP

STEREO MEMORY- 10 AMP

TRIM TABS- 10 AMP

SPOTLIGHT- 5 AMP

ACC.- 10 AMP

VHF- 20 AMP

RADAR PLOTTER- 5 AMP

GPS PLOTTER- 25 AMP

AUTO PILOT- NOT USED

DEPTH SOUNDER- 10 AMP

ACC.- 5 AMP

TYPICAL DC (12 VOLT) WIRING COLOR CODE & SIZES		
BLACK	16,14,12,10,8,6,4,2,2/0,40	GROUNDS
BLACK/WHITE	16	HALON INDICATOR
BLACK/YELLOW	10,16	GRD. DIESEL TRANSFER PUMP, MERC DIESEL STOP CIRCUIT
BLACK/WHITE	10	HALON MAIN GRD. FEED
BROWN/BLACK	10	MACERATOR, SUN ROOF
BROWN	10	SUN ROOF
BROWN	14	AFT BILGE PUMP-MANUAL
BROWN/WHITE	14	AFT BILGE PUMP-AUTO
BROWN/RED	14	FWD. BILGE PUMP-AUTO
BROWN/BLUE	14	FWD. BILGE PUMP-MANUAL
BROWN/PINK	16	CO DETECTOR
BROWN/BLACK	16	SHOWER SUMP PUMP
YELLOW	12,10	BLOWER
YELLOW/WHITE	16	HEAD VENT FAN MOTOR
YELLOW/BLACK	16	STEREO MEMORY
YELLOW/RED	14	ENGINE START CIRCUIT

Note: The list above applies to a number of vessels. Vessel components/wiring may vary depending on the model.

TYPICAL DC (12 VOLT) WIRING COLOR CODE & SIZES		
ORANGE	10,12	VACUUM TOILET, REFRIGERATOR, HATCH RAM
ORANGE	16	WIPER RUN
ORANGE/WHITE	16	WIPER PARK
ORANGE/BLACK	10,12,16	HORN, HATCH RAM
BLUE	14	INTERIOR LIGHTS, SWITCHED CIRCUIT
BLUE/RED	14	INTERIOR LIGHTS, CONSTANT HOT CIRCUIT
BLUE/BLACK	16	COCKPIT SOFT LIGHTS
BLUE/GREEN	16	INTERIOR SOFT LIGHTS
BLUE	10	CABIN LIGHT MAIN CIRCUIT FEED
GRAY	14	NAVIGATION LIGHTS, RUNNING, BOW, TRANSOM LIGHTS
GRAY/BLACK	14	NAVIGATION LIGHTS, AFT ANCHOR, MASTHEAD
GRAY/WHITE	14	NAVIGATION LIGHTS, MASTHEAD, FWD. RUNNING LIGHTS
RED	16	POSITIVE FEED- ELECTRONICS, GAS VAPOR DETECTOR, BREAKER TO DASH SWITCH FEEDS

Note: The list above applies to a number of vessels. Vessel components/wiring may vary depending on the model.

TYPICAL DC (12 VOLT) WIRING COLOR CODE & SIZES		
RED/WHITE	16	WINDLASS CONTROL-DOWN
RED/BLACK	16	WINDLASS CONTROL-UP
RED/WHITE	14	BATTERY PARALLEL-LOAD
RED	14	POSITIVE FEED-ELECTRONICS
RED	12	POSITIVE FEED-ELECTRONICS
RED	10	POSITIVE FEED-AUTO PILOT
RED/VIOLET	10	FUEL TANK TRANSFER PUMP AMPLIFIER POWER
RED	8	POSITIVE FEED- MAIN ALTERNATOR CHARGE
RED	6	POSITIVE FEED- MAIN ALTERNATOR CHARGE
RED	4	POSITIVE FEED-MAIN
RED	2	POSITIVE FEED- MAIN START-ER, BATTERY, GENERATOR
RED	2/0	POSITIVE FEED- MAIN, START-ER, BATTERY
PURPLE	16	STBD.IGNITION, HOUR METER-WINDSHIELD VENT
PURPLE/WHITE	16	PORT IGNITION, HOUR METER, WINDSHIELD VENT
PINK	16	STBD. FUEL TANK SENDER
PINK/BLACK	16	PORT FUEL TANK SENDER
TAN/BLUE	16	ENGINE ALARM CIRCUIT
GREEN	16	TANK LEVEL MONITOR, SPOT-LIGHT
GREEN	10	SPOTLIGHT
GREEN	8	BONDING

Note: The list above applies to a number of vessels. Vessel components/wiring may vary depending on the model.

(AC) ALTERNATING CURRENT-GENERAL INFORMATION

OVERVIEW

Alternating current sometimes called AC current is brought on board through the use of a dockside shore-power) cord, reel system or produced on board through the generator. Just as a residential home uses 120/240 volts to run various household appliances and equipment the same holds true on your vessel.

With AC current electrons "cycle" in one direction a short distance and reverse themselves traveling in the opposite direction. This is how AC became known as alternating current. The rate that the current reverses itself is referred to as frequency.

In the United States the alternating current frequency is 60 cycles per second. Overseas a 50 cycle frequency per second is standard. Component specifications must match the country's frequency.

BASIC ELECTRICAL TERMS

Voltage is a measurement of the electrical potential that an electrical power source contains for doing some type of work for us. Think of it as electrical pressure. An example might be your yacht's battery.

Amperage is a particular amount of electricity flowing through some part of a circuit. Think of it as the rate of electrical flow through your yacht's wiring.

Resistance is measured in ohms and inhibits the electrical flow through a circuit. An example would possibly be an incandescent light bulb. The resistance in the light bulb element allows it to glow and brighten the cabin along with giving off heat.

It is important that you understand and respect the alternating current system used on board. **Be sure to read and follow any danger, warning, or caution labels in reference to your electrical system or individual equipment components. Most of all, use common sense!**

DOCKSIDE (SHORE POWER) CORD SYSTEM

The shorepower inlets are located inside the port transom locker. *Before plugging in the dockside power cord check to see that all AC breakers are off. This includes the incoming as well as both the main and equipment breakers at the AC ship's control panel. See the AC panel illustration later in this chapter.*

When connecting the shore power cord be sure to twist the cord into the yacht inlet plug first. The inlet plug is located on the aft port deck. The cord installs one way only. Align the 2 pins with the 90 degree shape, (or use the imprinted arrows and detentes located on the stainless steel part of the inlet), insert the cord end straight into the inlet plug and twist in a clockwise direction to lock in place. Screw the threaded sealing ring into the shore power inlet until tight. This further secures the inlet and cord pins from moisture.

Plug the power cord into the marina dock power box last. This reduces the possibility of a shock hazard. There may be several types of inlet plugs located at the marina dock power center. The 30 amp plug is much smaller looking than the 50 amp system used on larger yachts.

Also, marina dock power centers normally have breakers that must be activated after installing the dockside cord. Make sure the dockside cord has enough slack to weather changing tides if applicable and at the same time does not come in contact with the water. Check with the marina dockmaster for more information on their shore power operation and requirements.

TYPICAL SHORE POWER INLET

WARNING
TO MINIMIZE SHOCK AND FIRE HAZARD:
1. TURN OFF SHORELINE BREAKER AT A.C. SWITCHING PANEL BEFORE CONNECTING OR DISCONNECTING SHORELINE CORD SET.
2. CONNECT SHORELINE CORD SET AT BOAT FIRST.
3. DISCONNECT SHORELINE CORD SET AT SHORE OUTLET FIRST.
4. SECURE RECEPTACLE COVERS WHEN NOT IN USE.
120 VOLTS 60HERTZ
TV
WARNING
30A 125V
DO NOT ALTER SHORE POWER CABLE CONNECTORS

WARNING LABEL SHORE POWER

DUAL 30 AMP INLETS

MAIN INLET BREAKER (SHORE 1)

MAIN TV CABLE INLET

MAIN INLET BREAKER (SHORE 2)

⚠ WARNING

PREVENT SEVERE INJURY OR DEATH!
ALTERNATING CURRENT (AC) CAN KILL YOU!
READ AND UNDERSTAND THE DOCKSIDE WARNING LABEL AT THE SHORE POWER LOCKER BEFORE ATTEMPTING TO ACTIVATE THE SHORE POWER SYSTEM.

⚠ DANGER

PREVENT BODILY INJURY, DEATH OR FIRE!
NEVER USE EXTENSION CORDS
OR IMPROVISED CORDS
IN SHORE POWER/MARINA INLETS.
USE ONLY APPROVED MARINE
SHORE POWER CORDS
MATCHING THE ORIGINAL
WIRE GAUGE AND AMPACITY .

⚠ WARNING

PREVENT SEVERE INJURY OR DEATH!
ALTERNATING CURRENT (AC) CAN KILL YOU!
DISCONNECT
ALL ELECTRICAL POWER SOURCES
BEFORE ATTEMPTING
TO REPAIR OR REPLACE
ANY ELECTRICAL COMPONENTS.

Before attempting to disconnect the shore power cord turn off all equipment and main AC breakers on the ship's control panel to prevent any component damage.
When disconnecting the shore power cord first turn the breaker to the "off" position at the marina dock power center. Then remove the dockside cord from the marina outlet. Always remove the cord from the yacht's power inlet last. Roll the cord neatly and store it in a dry environment.

Typical domestic 30 amp dockside cords (sometimes called the shore power cord) normally contain four conductors;

White-neutral ungrounded conductor

Green-grounding conductor

Red-ungrounded conductor containing 120 volts

Black-ungrounded conductor containing 120 volts

TYPICAL GALVANIC ISOLATOR

As part of the AC boat circuitry he green ground wire takes a different path. It exits the shore power inlet and travels to a galvanic isolator.

A 60 amp (60 hertz) galvanic isolator for domestic use is connected in series with the AC grounding "green" wire. Overseas vessels use a 30 amp (50 hertz) galvanic isolator.

The purpose of the galvanic isolator is to isolate the boat's grounding system from the shore-power ground. The galvanic isolator allows AC voltage to travel back to the green ground wire at the marina power center in the event a short exists on the boat. Also, the isolator blocks any DC current from traveling on the green ground wire. This eliminates the possibility of galvanic interaction from other boats in the vicinity.

The green ground or "bonding wire" runs from the yacht's shore power inlet or optional cord reel to the galvanic isolator. From the output of the galvanic isolator it runs to the AC ground buss located behind the AC main control panel in the salon.

Since the galvanic isolator is not polarized either terminal can be used for the inlet or output side for the green grounding wire. See the illustration.

There is a fan located inside the isolator. If you ever hear the fan running the **isolator has failed**. Disconnect the shore power from the boat and check the system. Call your closest Regal dealer for more information.

Do not to store objects inside the locker that might inhibit air flow to the galvanic isolator fan.

TYPICAL MAIN AC PANEL METER/SWITCH FUNCTIONS

The typical ship's main control panel is located at the starboard aft salon. Open the overhead cabinet door to gain access to the panel. The main call outs on the panel will be addressed. This panel serves as the main distribution for the incoming shore power from the marina power center or from the ship's generator when at cruise. The ship's main DC panel is located in the same locker. Notice that the panel features twin 30 amp service shown as Shore 1 and Shore 2.

SHOREPOWER PANEL DISTRIBUTION

As noted earlier the shore power cord delivers AC electricity through the boat's shore power inlet. The AC current travels through the vessel's electrical system to the main AC control panel. AC electricity is now ready to be distributed to the various equipment components when the appropriate breakers are activated.

TYPICAL AC MAIN SHIP'S CONTROL PANEL

REVERSE POLARITY INDICATOR

Before activating a 30 amp shore 1 or 2 breaker visually check for a green light at the reverse polarity indicator. The green light indicates there is no reverse polarity. If a red light appears on the revese polarity indicator a hot wire and ground are probably reversed somewhere in the circuit from the dock to the main panel.
In all cases do not activate the main inlet breaker. Take immediate corrective action to find the cause of the reverse polarity situation. At this point, disconnect the shorepower cord from the marina power center and call for professional assistance.

30 AMP MAIN AC PANEL SHORE POWER BREAKERS

There are two main shore power breakers on the panel labeled shore 1 and shore 2. These single throw, double pole main breakers control power to that side of the panel and when activated deliver electricity through a system of sub breakers to the entire boat through dedicated sides of the panel. Before you energize the main breaker make sure all sub breakers are deactivated. This prevents any excessive equipment motor draws and may eliminate any system arcing.
With the reverse polarity indicator displaying the green icon, activate shore breaker 1 by flipping the single throw arm to the on position. AC electricity now is distributed to that side of the panel.
On the shore power 2 main breaker pull the transfer switch to the left which will allow shore 2 breaker to be activated. Now the entire panel is powered up.
At this point turn on sub breakers as needed always being conscious of the load current meter. Use the toggle switch to view both shore 1 and 2 loads.

60 AMP AC GENERATOR BREAKER

When the vessel is under generator power at sea AC electricity is distributed through the 60 amp main generator breaker located on the AC main ship's panel beside the main breaker. See the previous illustration and the generator section for further information.

Before activating the generator AC breaker it is recommended to make sure all equipment breakers are "off."
After starting the generator activate shore 1 breaker.Then push the bar on the generator portion of the panel up and then activate the generator breaker.
With the generator running activate shore 2 by flipping the shore 2 breaker to the on position. Move the bar up and flip the transfer switch on which will direct current to shore 2 main and sub breakers.

LINE VOLTAGE/CURRENT METERS

After the shore power 30 amp main breaker or generator 60 amp breaker is activated line voltage will display on the the main panel.
As sub panel equipment breakers are activated the load current meter (extreme right side of panel) will show an amperage draw. Normally the amperage will ascend as more equipment breakers are activated and will descend as equipment breakers are deactivated.

The 120 volt shore power switch is located between the line voltage and load current meters. With the shore power switch in the "center" position it is off. When the shore power switch is toggled to the left the line voltage meter will display up to 120 volts available at Shore 1. As equipment breakers are activated the load current (amperage) meter will ascend and descend as equipment breakers are deactivated.

When the shore power switch is toggled to the right the line voltage meter will display up to 120 volts available at Shore 2. As equipment breakers are activated the load current (amperage) meter will ascend and descend as equipment breakers are deactivated.

As a general note on equipment breakers when leaving the yacht it is recommended that most breakers be turned off.

It may be necessary depending on your needs to leave the shore power cords hooked up and the battery charger on during extended periods along with the salon refrigerator. Since the refrigerator is dual voltage (12 and 120) make sure the DC refrigerator breaker is activated and the AC refrigerator breaker is deactivated upon leaving the vessel.

SHIP'S MAIN PANEL AC BREAKER DESCRIPTION (TYPICAL)

BREAKER TYPE	AC AMPERAGE	BREAKER TYPE	AC AMPERAGE
SHORE 1	30	SHORE 2	30
	30		30
GENERATOR	60	TRANSFER	50
	60		50
AIR CONDITIONER-AFT*	NOT USED	AIR CONDITIONER-FORWARD	30
A/C PUMP	5	BATTERY CHARGER	15
FWD. OUTLETS	15	ICEMAKER	15
MICROWAVE	15	REFRIGERATOR	10
AFT OUTLETS	15	ACC.	15
STOVE	20	WATER HEATER	15

*On newer panels the aft air conditioner and A/C pump breakers have been eliminated since there is only one air conditioner on this vessel

Note: Refer to main ship's panel illustration as needed.

GFCI Outlet

Sometimes current in a circuit escapes its normal route and finds a "ground fault". If that vehicle ends up to be your body and the current passes through your heart the results could be deadly.

A ground fault interrupter or GFCI senses the difference between the hot and neutral wire current before a fatal dose can be conducted and in a fraction of a second cuts the current.

The GFCI devices used in homes are normally not ignition protected. GFCI's used are 15 amp and are ignition protected.

Your boat uses 120 volt receptacles. By using a GFCI as the first receptacle in the circuit all the receptacles down stream on the same circuit are protected by the initial GFCI. This is accomplished by attaching the hot wire to the line terminal of the GFCI receptacle and the out-going hot wire to the load terminal. The neutral wires also use line and load terminals on the opposite side of the GFCI receptacle.

You can identify the GFCI primary receptacle by the test and reset breaker in the center of the device. Check the GFCI protection monthly. If a problem develops with the GFCI circuitry call a marine electrician to access the situation.

The GFCI outlets are especially useful when electrical equipment is employed such as a drill or in the bathroom with the use of personal devices such as curlers and hair dryers. Never use any electrical devices when puddling water is present to prevent a possible shock hazard.

GFCI'S (GROUND FAULT CIRCUIT INTERRUPTER

The GFCI is programed to protect a person from line to ground shock hazards which could occur from various electrical devices operating off of the device or receptacles down stream. It does not prevent line to ground electric shock, but does cut down the exposure time to a fraction of a second before the device trips. It does not protect people against line to line or line to neutral faults. Also, it does not protect against short circuits or overloads; this is the circuit breakers job.

All GFCI's should be tested monthly to make sure they and the receptacles they protect "downstream" are protecting against ground-faults.

WARNING

TO PREVENT POSSIBLE ELECTRICAL SYSTEM DAMAGE OR FIRE DO NOT TRY TO ACTIVATE SHORE POWER MAIN BREAKERS IF REVERSE POLARITY LIGHT IS DISPLAYED.

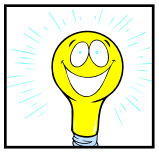
Testing GFCI'S

Also, GFCI down stream receptacles can be tested with a plug-in type GFCI tester. This tester contains a GFCI test buton which accomplishes the same thing as the GFCI receptacle built-in test button. This tester can be purchased at electrical supply houses or marine retailers.

To test a GFCI find a 120 volt night light or small lamp to plug into the GFCI outlet. Try it in another circuit first to make sure it lights.

After the lamp is plugged into the GFCI outlet the lamp should light. Now press the "test" button at the GFCI receptacle center. The GFCI's "reset" button should pop out and the lamp should go out. This means the GFCI itself is functioning properly. Press the "reset" button to restore power to the outlet. *Test each GFCI circuit monthly.* You can use the lamp to check receptacles down stream from the GFCI. All receptacles should light the lamp and should go out when the "test" button is pressed.

POSSIBLE PROBLEMS/SOLUTIONS (GFCI'S)



1. If the "reset" button does not pop out, the GFCI is probably defective and should be replaced.
2. If the "reset" button pops out one time but tends to stick the next the GFCI should be replaced.
3. The GFCI "reset" button pops out when something is turned on. This may indicate an internal wiring problem with the GFCI or there may be a ground-fault down stream.
4. The GFCI "reset" button is in the pressed position and nothing works. Check the appropriate breaker at the main ship's AC control panel to make sure it has not "tripped" or as been deactivated.

Ignition Protected Devices

Many electrical devices in everyday use tend to "arc" or spark when being used. These include motors, fans, switches, relays, etc.

Boats in general use many of these same devices but they are protected from any sparking that may cause the device to ignite with any vapors that are typically found in the engine room and/or fuel tank compartments. The marine devices use special ignition proof shields or arrestors to prevent arcing to the atmosphere.

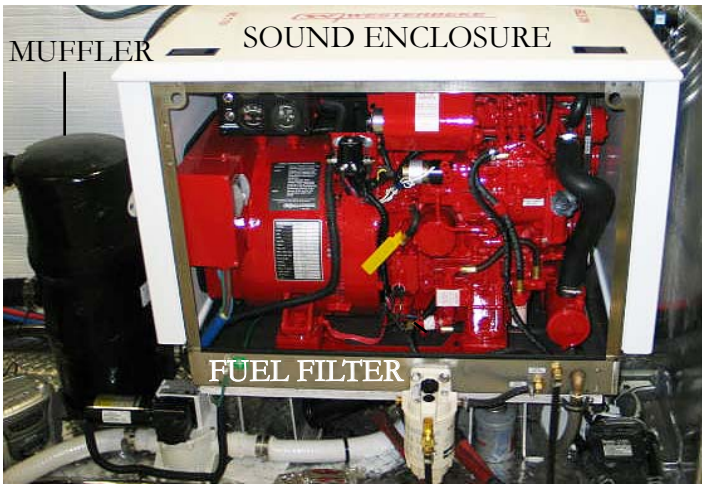
Obviously, gasoline powered vessels contain a much higher risk of explosion over diesel powered vessels but diesel under the right circumstances can ignite and burn. Still when replacing any electrical device especially in the bilge or engine room make sure it is ignition protected. This means it has been tested and normally the device is stamped with a marking making it safe to use. Most automotive type devices are **not** ignition protected especially engine starters and alternators.

TYPICAL AC GENERATOR (GEN-SET)

OVERVIEW

If installed the generator (gen-set) is used to provide on board alternating current (AC) when the vessel is unplugged from the dockside cord. Generator frequency known as hertz is domestically set at 60 while overseas countries normally require a setting of 50. As the generator reaches full rated no load output (amps) at 60 hertz it should display 120 volts. At 50 hertz it should display 230 volts.
The generator is located in the engine room. Some basic system components are identified below.

TYPICAL GENERATOR



The generator features a sound enclosure which reduces noise and enables quick access for most inspections, troubleshooting and routine maintenance.

Typical Generator Fuel System

The generator is supplied by the same fuel tanks as the engines. The fuel system features an in-line remote fuel filter located below the generator. It's job is to keep fine particles and water out of the generator fuel system. Refer to the vendor information for periodic maintenance schedules. Clean fuel is the life line of generator performance.

Note A smaller hose barb connector on the fuel tank is used for generator fuel feeds normally one with a 1/4" diameter.

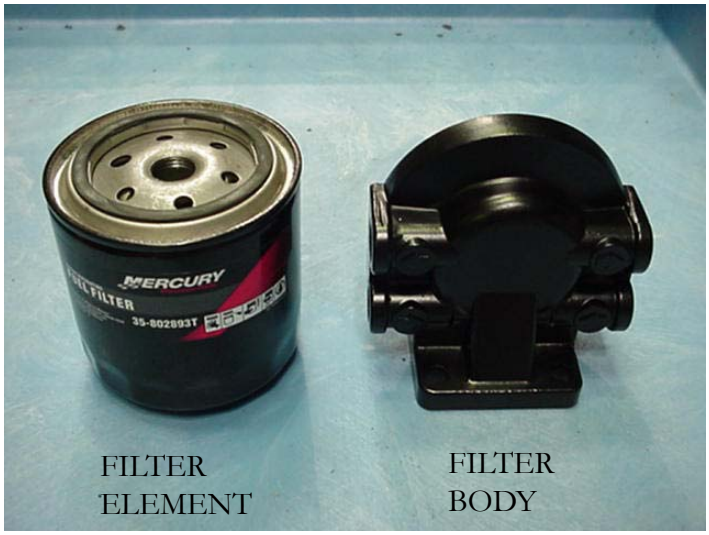
Fuel Filter Element Overview-Gas Generator

Since water is heavier than fuel it will settle in the bottom of the element. Periodically replace the fuel filter element With a strap or fitted wrench turn the element counterclockwise until loose. Unscrew by hand and release from the filter body. Use an environmentally safe container to catch any contaminated fuel. Dispose of according to local or state regulations.

Coat the O ring (gasket) of the new element with oil. Hand tighten by turning clockwise until tight.

Note: Water in gasoline or diesel fuel will gather at the bottom of the container. Since it is heavier water will normallly appear as a different color and consistency and normally can be spotted as in moves back and forth.

Run blower for at least 4 minutes. Start engine and check for leaks.



TYPICAL GENERATOR GAS FUEL FILTER

Typical Electrical System

The generator starting system normally uses the port cranking battery. The generator is usually started at the 12 volt ship's control panel located in the salon but it can also be started using the remote instrument panel located at the generator itself as needed. The latter is especially useful while maintenance is being conducted. The generator remote instrument panel features temperature, oil, DC volts, hour meter gauges and pre-heat, start and stop switches. The starting switches can be reached through an access panel at the sound shield.

One of the switches is set up different on the ship's main control panel. Here the pre-heat switch is called an "on" switch. The start and stop switches by name and function are identical to the switches on the remote panel.

Changing Element

The element needs to be changed periodically. Signs of necessary element replacement may be power loss, hard starting or large levels of contaminants/water in the element bowl when drained.

To replace the element first remove the old one by turning by hand in a counterclockwise direction. Be sure to have a pan in place to catch any dripping fuel. Coat the new element and O ring with clean oil and then thread the element clockwise by hand until snug. **Do not use any tools.**

Start the engine and check for fuel or air leaks.

ILLUSTRATION A

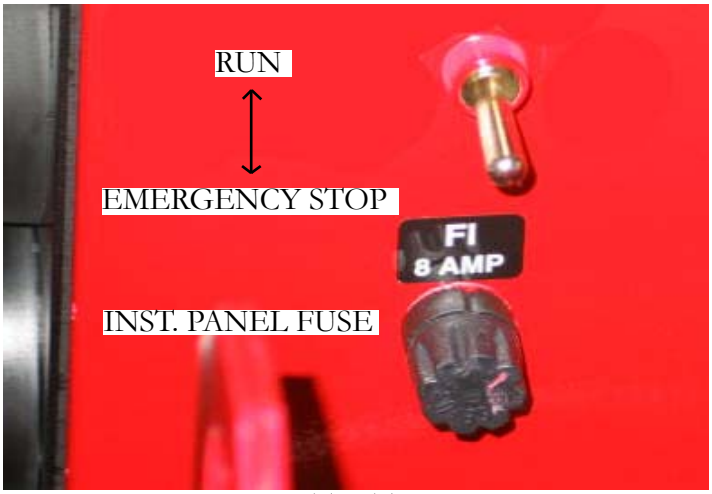


ILLUSTRATION B

TYPICAL GEN-SET SWITCH CLUSTER- MAIN PANEL

Note the illustrations showing the remote instrument and start panel. As part of the generator electrical system an 8 amp fuse protects the remote instrument panel wiring circuit. See illustration B.

Above the fuse is a switch. This switch must be in the "run" position or the generator will not start. The emergency stop switch shuts the fuel off to both the remote and ship's main control panel and is normally for maintenance purposes. See illustration B.

A 20 amp DC manual reset breaker protects excessive current draw or electrical overload anywhere in the generator engine wiring. Should this breaker trip the generator will shut down. Reset the breaker only after the cause of the problem has been determined. See illustration A.

An AC breaker will automatically disconnect any generator AC power from reaching the main ship's control panel in case of an electrical overload. It can be manually shut off when performing generator maintenance to ensure no AC power is coming out of the generator. See illustration A.

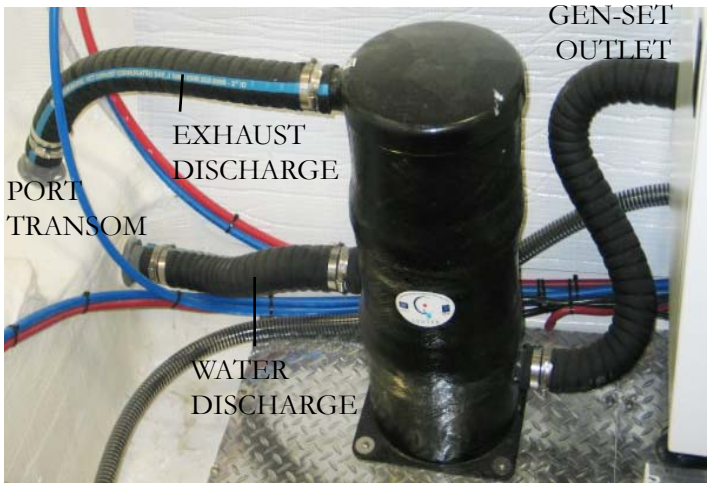
NOTICE

TO PREVENT POSSIBLE GENERATOR DAMAGE ALL SHORE POWER BREAKERS AND AC SWITCHES NEED TO BE DEACTIVATED BEFORE STARTING OR STOPPING GENERATOR.

Typical Generator Exhaust System

The generator exhaust system features a dual tier operation. As the water and exhaust exit the generator they travel to the muffler. The muffler discharges the heavier water out the muffler bottom and through the hull. The exhaust itself is exited out the muffler top and through the hull. The benefits of the system are two-fold. First, the actual decibel or sound level is decreased. In addition, the lower resonating sound is more pleasing to the ear. For colder climates, a drain plug is installed in the muffler.

TYPICAL GENERATOR MUFFLER



Before departure always check the hose connections for signs of water and air leaks. Tighten hose clamps as needed.

Before Starting Generator

The following items should be checked each time before starting the generator. This covers the basic system components.

☑ Turn generator seacock off. Check strainer for debris. Turn generator seacock on before starting generator.

☑ Ensure that all main panel and equipment breakers are off.

☑ Inspect the generator for fuel, oil, exhaust or water leaks.

☑ Check generator engine oil level. Top off with correct viscosity as required.

☑ Check coolant for proper level at recovery tank. Add as needed.

☑ Check the main fuel tank to ensure there is adequate diesel for both the generator and the engines. Apply the one-third rule.

☑ Check for loose wires at the alternator.

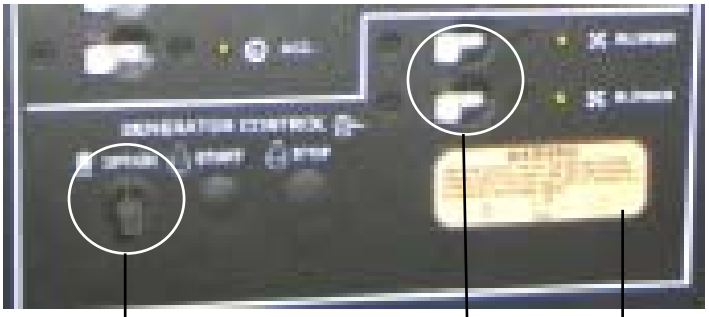
☑ Check the port side cranking battery (weekly).

☑ Check drive belts for wear and proper tension (weekly).

☑ Record the hour meter reading to meet maintenance scheduling.

Generator

Besides the shore power capability to deliver alternating current some vessels feature optional generators for supplying AC voltage. Generators use their own ventilation and motor to produce AC electricity on board the vessel.
The following illustration is part of the main DC panel discussed earlier in this chapter.



Generator Ventilation

Read and understand the blower warning label before attempting to start the generator. Be sure to activate both blower switches as these switches assist in evacuating any fumes from the bilge area. Always open the engine hatch and do a snife for gasoline fumes before attempting to use the blowers. It is better to be safe than sorry.

Before Activating Generator

Before starting the generator make sure all equipment switches and shore power breakers are in the "off" position. This procedure helps prevent any voltage surges when the generator starts. Refer to the AC panel illustration.

Generator On/Off Switch

After the blowers are activated and run for at least 4 minutes the generator can be started. Energize the toggle style on/off switch until the generator starts. At that point release the switch and the generator starter will disengage from the flywheel. The generator should continue to run on its own.

Generator Main Breaker

After the generator starts the current produced needs to be correctly routed to its final destination. Slide the shore 1 breaker to the left and slide the generator arm to the uppermost point. While holding it there, turn on the generator breaker. This will begin the AC current routing. The second portion of the process is accomplished with the transfer slider.

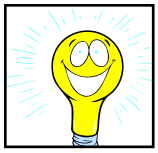
Generator Transfer

With the generator breaker in the on position activate the shore 2 breaker. Energize the transfer breaker by moving the slider bar up. Turn on the transfer breaker. The appropriate equipment breakers can now be turned on. Monitor the AC load current display for total amperage draw as equipment is activated.

Generator Shutdown Procedure

To shut the generator down deactivate all AC equipment breakers. Move the transfer slider upward and deactivate the transfer breaker. Finally, energize the generator stop toggle switch until the generator stops.

POSSIBLE PROBLEMS/SOLUTIONS



1. With generator main control panel activated there is no voltage at the AC line voltage meter. Check AC output breaker on the generator. It may of tripped due to an overload.

2. The generator stopped do to overheating. Check the generator strainer for obstructions such as seaweed, plastic, or shellfish. Be sure to turn off seacock before removing the strainer basket.

3. The generator will not start from the main ship's panel after being serviced. Make sure the generator mounted switch is in the "run" position.

4. The generator will not crank over to start. Check the port cranking battery by starting the port engine. If it starts battery is up. Then check all generator battery connections. Tighten any loose connections.

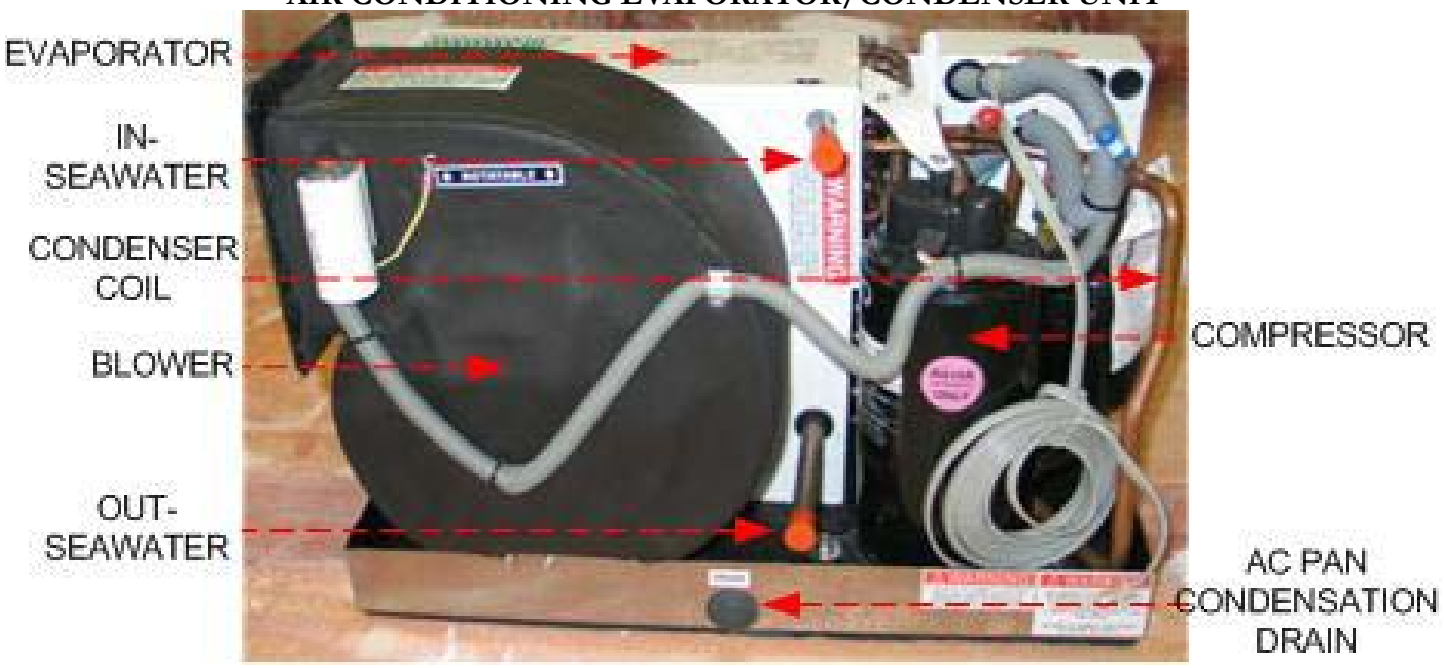
TYPICAL AIR CONDITIONING SYSTEM

Overview

The current air conditioning dual zone system features a total output of 18,000 BTU's (British Thermal Units). The system utilizes a single 230 volt pump which delivers cooler seawater to the evaporator/condenser found under the main cabin/salon floor. Warmer seawater exits the boat through a manifold and various thru-hull fittings.
The evaporator/condenser unit incorporates a compressor to compact the R-22 refrigerant.
The Elite control panel (thermostat) for the air conditioning system is located in the main cabin (salon).

TYPICAL A/C PUMP

TYPICAL
AIR CONDITIONING EVAPORATOR/CONDENSER UNIT



Reverse Heat

Your air conditioning system features a reverse heat cycle. This can be extremely valuable to boater's in colder climates especially for early spring and late fall cruising.
To accomplish reverse cycle heating, the R-22 refrigerant flows in the opposite direction through a reversing valve located on the evaporator/condenser unit. Heat is transferred from the seawater in the coil of the condenser to the R-22 refrigerant and then to the air as it is blown through the evaporator to the cabin.
Obviously, the temperature of the seawater will effect the air conditioner efficiency.

The temperature variance for cooling efficiency is:

Up to 90 Degrees F. (32.2 Degrees C.)

The temperature variance for heating efficiency is:

Down to 40 Degrees F. (4.4 Degrees C.)

Typical Air Conditioning System Operation

Below is a basic quick start-up checklist for the air conditioning system. **For more in depth information, refer to the vendor operation manual found in the owner's documentation folder** located in the port aft set of drawers in the aft master stateroom cabinet.

Operations Quick Start-Up Checklist:

1. Check the AC seawater strainer for debris.

2. Make sure the AC seawater pump seacock located in the engine room is opened completely (handle should be in-line with the hose).

3. Activate that breaker at the ship's main AC control panel located in the starboard aft salon overhead cabinet.

4. Activate the air conditioner pump breaker located at the ship's main AC control panel.

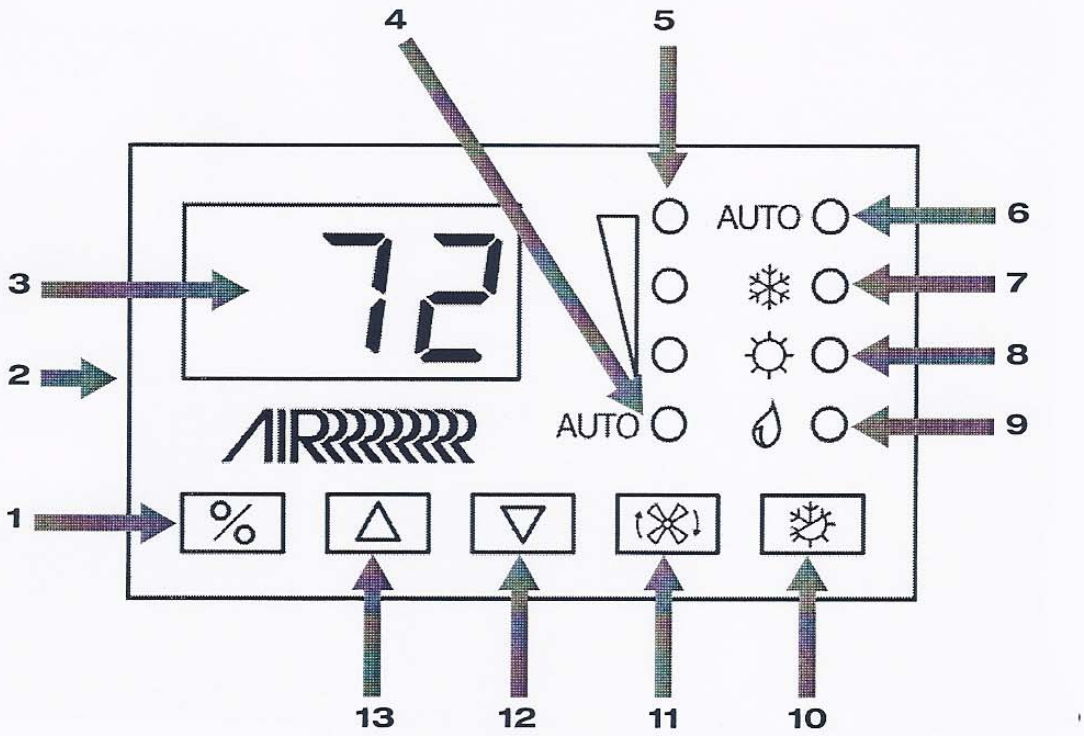
5. Check the port hull side for a steady stream of seawater. Seeing water here is normal when the forward/aft AC pumps are running. See illustration. If stream is diminished or no water emits from the fitting immediately turn the AC pump off and investigate the cause of the problem.

5. Press the Elite thermostat Power button once to activate the air conditioning system. A blank screen displays when system is off and indicates present cabin temperature.
6. For cooling or heating press and release the Mode button until the desired LED is illuminated ie; automatic mode.

7. Press the Up or Down button to set the desired cabin temperature. To view the set point, momentarily press and release the Up or Down button.

8. Auto fan LED lights when Auto fan speed is selected.

TYPICAL ELITE AC CONTROL DIAGRAM



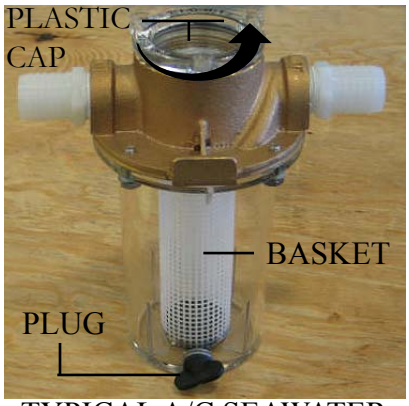
Elite Display - Diagram Legend

1	Power button	8	Heat Mode indicator
2	Temperature sensor	9	Moisture Mode indicator
3	Digital display	10	Mode button
4	Auto Fan indicator	11	Fan button
5	Manual Fan indicator (high, medium, low)	12	Down button - Lower temperature set point
6	Auto Mode indicator	13	Up button - Raise temperature set point
7	Cool Mode indicator		

Note: The Elite display continually monitors the system components. Should a problem develop it sends a diagnostic code to the control (thermostaat) display. Refer to the vendor air conditioning manual (troubleshooting) to assist in identifying the problem.

TYPICAL A/C INSPECTION TIPS

Seawater Strainer



TYPICAL A/C SEAWATER STRAINER

The air conditioner seawater strainer located in the engine room should be cleaned periodically of debris which can inhibit or stop the fresh seawater supply.
Always turn the seacock to the off position (90 degrees to the hose fitting) before cleaning a seawater strainer. Remove the basket by turning the plastic cap in a counterclockwise direction. Set the cap and the O ring aside. Pull the basket from the unit, rinse with water, air dry and reinstall. Sediment at the bottom can be removed by just turning the plug in a counterclockwise direction. Set the plug and O ring aside. Place a container under the strainer to catch the sediment. Coat the O rings with waterproof grease containing a silicone or teflon base. Reinstall O rings along with the plug and plastic cap. Turn on the seacock and check for leaks.

Return Air Filters

Once a month check the return air filter located on the face of the evaporator. To clean rinse with fresh water, air dry and reinstall.

WARNING

PREVENT SEVERE INJURY OR DEATH!
DISCONNECT
ALL ELECTRICAL POWER SOURCES
BEFORE ATTEMPTING
TO OPEN, REPAIR OR REPLACE ANY
AIR CONDITIONING COMPONENTS.

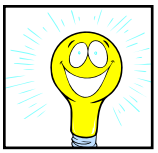
Drain Pans

As noted on an earlier page the AC evaporator/condenser units feature a 2" deep drain pan connected by a hose that runs to a sump pump and eventually exits overboard. Periodically just like your home AC, the pan needs to be rinsed clean of debris and possible mold.
You can use a purchased product made specifically for cleaning AC units. Disconnect the outlet hose from the AC pan and install a made up hose (5/8") that will catch the used solution to fill a small container. Dispose of the container in accordance with federal, state and local regulations. Pour the solution into the pan and allow time for it to drain. Reconnect the original drain pan hose when finished.

Condenser Coil Cleaning

Periodically the condenser coils are recommended to be cleaned. This procedure should be done by a professional since an acid solution must be used.

POSSIBLE PROBLEMS/SOLUTIONS (A/C)



1. No or little water is noticed at the thru-hull fittings and a HPF shows on the display which means the high pressure switch is open.
The strainer or intake hose may be clogged, seacock may be closed or a hose may be collapsed or kinked. Check AC pump breaker to verify pump operation.

2. Air conditioner will not start. Ensure the proper AC breaker is actuated on the ship's main control panel.

3. No cooling or heating. Lower or raise set point on thermostat control to offset set point being satisfied. Check for obstructed seawater flow. Remove discharge side of pump hose to purge air (air-lock). Seawater temperature too high for cooling and too low for heating.

4. Fan coil is iced. Raise or lower control set point. Clean return air filter. Switch AC to heat until ice melts or as a last resort use a hair dryer to melt ice as needed.

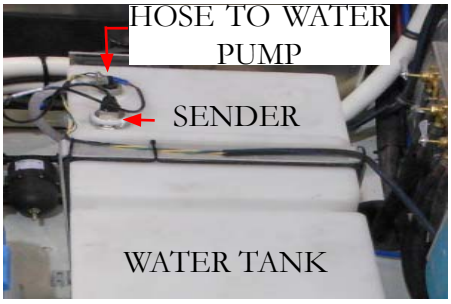
TYPICAL FRESH WATER SYSTEM

Overview

Your vessel is equipped with a fresh water supply system. It consists of a fresh water tank, deck fill/vent fittings, monitor panel, pressure water pump with filter, distribution system, and hot water heater. As needed the pressure demand type pump is energized, or the dockside system distributes water through the vessel.

The system is normally winterized from the factory utilizing a product called "Freeze Ban". It is best to completely drain the Freeze Ban before adding any water to the tank in order to minimize the taste of Freeze Ban. Freeze Ban will not harm you but it does have a peculiar taste.
The system requires little maintenance except occasional flushing of the tank, cleaning of the water filter and winterizing in cold weather climates.
For more specific information on the water system contact your closest Regal dealer.

Filling Water Tank At the Deck Fill



The fresh water system uses a tank to distribute water on board also known as potable water. The water tank is located in the forward part of the engine room.
There is a water fill located on the starboard aft deck along with a vent fitting used to evacuate any air from the tank as it is being replaced during the filling process. Make sure you do not mistake the water fill cap for waste or diesel. To fill the system turn the water fill cap counterclockwise. Remove the cap and insert the supply hose. **Make sure the water source is pure and drinkable.**
Fill until you see water emerging from the deck vent. Reinstall the fill cap and use the designed "key" to tighten it. If you do not have a key a quarter coin will work well.

Periodically check the water fill cap for tightness. On the underside of the water fill cap is an "O ring" which aids the water fill cap to seal properly. The "O ring" should fit tightly around the cap. If it is loose, cracked or damaged replace it since it helps to keep debris out ot the water system.
For general knowledge all red water lines carry the "hot" water on board your vessel. Likewise, all blue water lines carry the "cold" water.

Note: To completely turn vessel water off:

1. At mooring with the standard dockside water inlet valve connected turn the marina faucet off. Disconnect the dockside water inlet hose.

2. At sea deactivate the pressure water system breaker at the main ship's electrical panel located in the salon.

Using Fresh Water (Potable) System

1. Fill the fresh water tank(s) until water is seen at the deck water fill vent.

2. At the ship's main service panel activate the fresh water pressure pump system breaker. This will energize the fresh water pressure pump to send fresh water from the potable water tank through the cold water lines terminating at the various faucets and related components.

3. Open a faucet. Water pressure should be present. Opening each faucet for a few seconds will purge any air in the system especially in cases where the fresh water tank has run out of water. When water is running at a particular faucet it is not unusual to hear the water pump activate as it is trying to build up the pressure required in the system. Soon after the faucet is turned off the fresh water pump sound will end indicating the fresh water system is now up to specified system pressure.
Note: If the fresh water pressure pump continues to run long after the faucets are deactivated check for fresh water system leaks.

Note: Related to the above periodically check the fresh water monitor for fresh water tank levels. Do not run pressure water pump with system dry as water pump component damage will occur.

WARNING

PREVENT PROPERTY DAMAGE!
DISCONNECT
THE DOCKSIDE WATER INLET HOSE
BEFORE LEAVING THE VESSEL.

Fresh Water Pressure Pump

In theory the fresh water pump system provides water pressure when dockside water is not available or used. Once energized the pump is automatic. It will shut down once system pressure has built up and will automatically start after a faucet is opened.
The fresh water pressure pump features a removable strainer basket filter which collects any debris which has entered the fresh water system. The clear strainer cover highlights any debris.
To clean the basket make sure the pressure water pump is off at the ship's DC control panel. Unscrew the clear cover to access the strainer basket. Remove the strainer basket, clean, rinse with fresh water and reinstall basket and cover. Do not overtighten or use tools. Turn on the pressure pump breaker and check for leaks.

Note: It is recommended that the fresh water pressure pump breaker be flipped to the "off" position when leaving your yacht to help prevent damage should a leak develop in the hot or cold water system.

TYPICAL ENGINE ROOM FRESH WATER PUMP

Operating Typical Standard Dockside Water System

At Mooring-Using Dockside Water Inlet:

1. Verify that the dockside water is pure and safe to use.

2. Locate the dockside inlet valve at the transom. Unscrew the cap. Connect a clean hose to the vessel's dockside water inlet fitting and the marina dockside water supply. A 50 foot white hose (safe for carrying drinking water)should reach most dockside faucets. Note: The dockside water inlet valve uses a system in-line valve that keeps the water traveling in one direction only.

3. Open the marina water supply faucet (spigot) which at this point will distribute dockside water to the vessel.

4. It may be helpful to open an on board faucet to help eliminate any air in the lines. **Note that the pressure pump system is not activated when using the dockside water inlet system.**

TYPICAL DOCKSIDE WATER INLET

At Sea-Using Fresh Water Pressure Pump System

1. Energize the fresh water pump breaker at the ship's main DC panel. This will permit water to flow to the appropriate faucet or component.
Note: Remember that all fresh water at sea is being delivered through the on board potable water tank.
Therefore, it is important to periodically check the fresh water monitor for remaining on board quanities.

WARNING

PREVENT PROPERTY DAMAGE!
DEACTIVATE THE FRESH WATER PRESSURE PUMP BREAKER AND DOCKSIDE WATER INLET HOSE BEFORE LEAVING THE VESSEL.

Typical Monitor Panel

The water system features a water/waste system monitor panel which senses the amount of water left in the potable water tank system. It is located at the ship's main electrical control panel in the aft starboard salon.
To use the panel, press the switch in toward the freshwater tank position and hold. The amount of potable tank water will be displayed. The sender for the fresh water monitor is located on the top of the starboard fresh water tank which is located in the engine room. The key switch is used for overboard discharge. Read and understand the section on using the macerator in the waste system before attempting to operate the overboard discharge system. *Laws in many locals prevent the use of overboard discharge. A person could be severely fined so know the restrictions before using the macerator pump-out.*

TYPICAL WATER/WASTE MONITOR PANEL

NOTICE

Do Not Use Waste/Pump-Out
Before Knowing Laws/Regulations
Regarding Dumping Waste.

Sanitizing Water System

If the vessel has been in an extended storage condition or you suspect the water system may be contaminated, then the system should be sanitized.
You can purchase a water treatment kit with ingredients that will sanitize the system. Follow the directions with the treatment kit. If a water treatment kit is not available follow these steps to sanitize the water system.

1. Make sure the water tank is pumped until empty. Shut off the *water pressure* breaker at the 12 volt ship's panel.

2. You will need approximately one gallon of a reduced bleach solution per each 15 gallons of tank capacity.

3. Formulate the correct amount of reduced bleach solution by mixing 1/4 cup of unscented household chlorine bleach per gallon of water. Press the monitor panel water tank switch at the ship's control panel to determine the approximate number of gallons left in the water tank.

4. Pour the weakened bleach solution into the water tank. Again, use the formula of 1 gallon reduced bleach solution for every 15 gallons of tank capacity.

5. To further reduce the power of the bleach solution fill the remainder of the water tank with fresh, clean water.

6. At the ship's 12 volt control panel, "flip" the water pressure breaker to the "on" position. Turn on the faucets to purge any system air and to circulate the bleach solution to all areas. Now turn off the water pressure breaker.

7. Let the solution set in the system for 3-4 hours.

8. Pump the water tank until empty.

9. Fill the water tank full with fresh, clean water. Turn the faucets on a let the entire tank flush through the system.

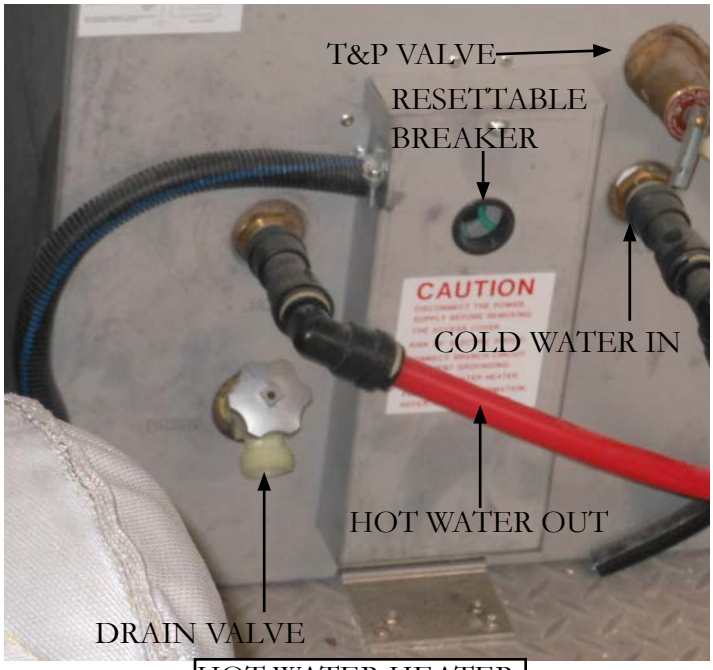
10. Again, fill the tank with fresh, clean water. Turn faucets on to remove any air. The water system is now sanitized.

Transom Shower

Your vessel offers a hot and cold transom shower located near the swim platform. To use make sure the fresh water pressure pump breaker is activated at the ship's AC/DC control panel. Open the hot and cold sides and regulate the temperature. *Always test the water temperature before using the shower nozzle.*

Typical Hot Water Heater

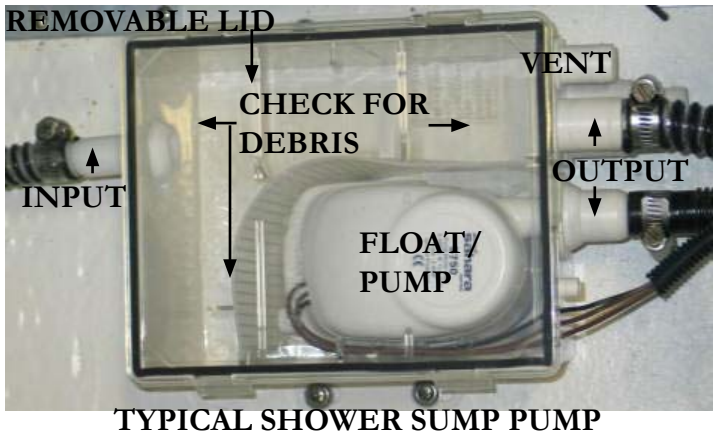
Your boat offers a hot water heater which is controlled by the generator at sea or shore power while at dockside. Like home water heaters the unit uses a T and P valve which protects the hot water tank from excessive pressure due to the water overheating. Should this occur the valve would open and direct steam, etc. to the bilge.
Also, there is a one-way valve that keeps the hot water from back flushing into the cold water supply. The hot water heater incorporates a drain valve to purge the system of mineral deposits. A reset button is found at the aft end of the component.



HOT WATER HEATER

Typical Shower Sump Pump System

The head/shower water supply is controlled by the water system manifold.
As part of the drainage system a self-contained shower sump pump collects all water and debris. After the water reaches a predetermined level the float switch permits the pump to send the used shower water to an overboard thru-hull fitting.
After showering, always let about one gallon of water settle through the shower drain to help rid the shower, drain, lines, and shower sump pump of debris, hair, and mineral deposits.



TYPICAL SHOWER SUMP PUMP

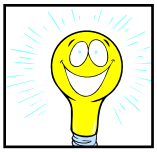
WARNING

TO PREVENT HOT WATER HEATER DAMAGE!
NEVER ACTIVATE THE BREAKER
WHEN THE HOT WATER HEATER
IS NOT COMPLETELY FULL OR
THE ELEMENT WILL BE DAMAGED!

Typical Accumulator Tank

Located in the engine room close to the fresh water pump is the fresh water system accumulator tank. This component provides extra water pressure especially during high demands with the on board fresh water system. This may include showering, using a transom shower, or washdown faucet.
Note that the accumulator tank normally requires no service. It contains a pre-determined amount of air pressure for the unit to preform efficiently. Should the unit leak down it will need to be reinflated with air. There is a fitting on the end of the tank for this purpose. Contact your closest Regal dealer for more information.

POSSIBLE PROBLEMS/SOLUTIONS-FRESH WATER SYSTEM



1. Fresh water pressure pump cycles on and off. Normally this type of action indicates a water leak in the system. Check all fresh water system related equipment on the deck, cabin, and engine compartment for leaks. Do not forget wash down equipment including spigots. Look for puddled or dripping water.

2. Using potable water system the water pressure is weak. Check the fresh water pressure pump filter for debris. Also, make sure the potable water tank level is sufficient at the salon monitor.

3. Water at sink or shower is hammering and has air bubbles in it. Check for air leaks in the system along with low water levels in the potable water tank.

4. Water is backing up in the shower. Find the correct shower sump pump. If it is full of water even when running there normally is a clog at the pump screen. Clean as needed.

5. There is no water at any of the fresh water related equipment such as faucets, showers and wash downs. Check to make sure the fresh water pressure pump breaker is on. Also, check the fresh water monitor for tank levels at the salon control panel.

6. The water system has a bad odor. Use the fresh water pressure pump to drain the fresh water system. Do not drink the water as it may be contaminated. Sanitize the water system as explained earlier in this chapter

7. There is no hot water. Turn the hot water heater breaker to the off position. Remove the back cover on the water heater and check the reset button. Push to reset. Also, the heating element may of malfunctioned. At this point, call a service technician.

8.. Low water pressure especially while showering. Make sure accumulator tank is cycling properly.

TYPICAL WASTE WATER SYSTEM

Overview

The waste water system includes a waste tank located under the center salon floor. Besides the tank the system features an amidship toilet and waste pump-out fitting. A monitor panel shared with the fresh water system displays the waste tank level when activated.
If installed, a macerator (overboard discharge pump) diverts waste through a hull bottom seacock (where dumping laws permit).

TYPICAL WASTE TANK

WASTE TANK HOSE FUNCTION	
EQUIPMENT	FUNCTION
Pump Out	To Pump Out Deck Fitting
Vent	To In-Line Vent
Head	From Head
Overboard Discharge	To Macerator (Overboard Discharge Pump) Located In Engine Room
Gray Water(Opt)	From Shower Sump Pumps

Gray Water System

If installed, the gray water system is used in areas where dumping fresh water waste products overboard is prohibited. Gray water originates from onboard sinks and showers. With this system all the gray water is pumped into the waste holding tank via the shower sump pump system verses directly overboard. The holding tank periodically needs be to be pumped out by a marina pump out station through the "waste" fitting on the starboard deck. Use the waste water portion of the monitoring panel at the ship's main control panel to check waste water levels.

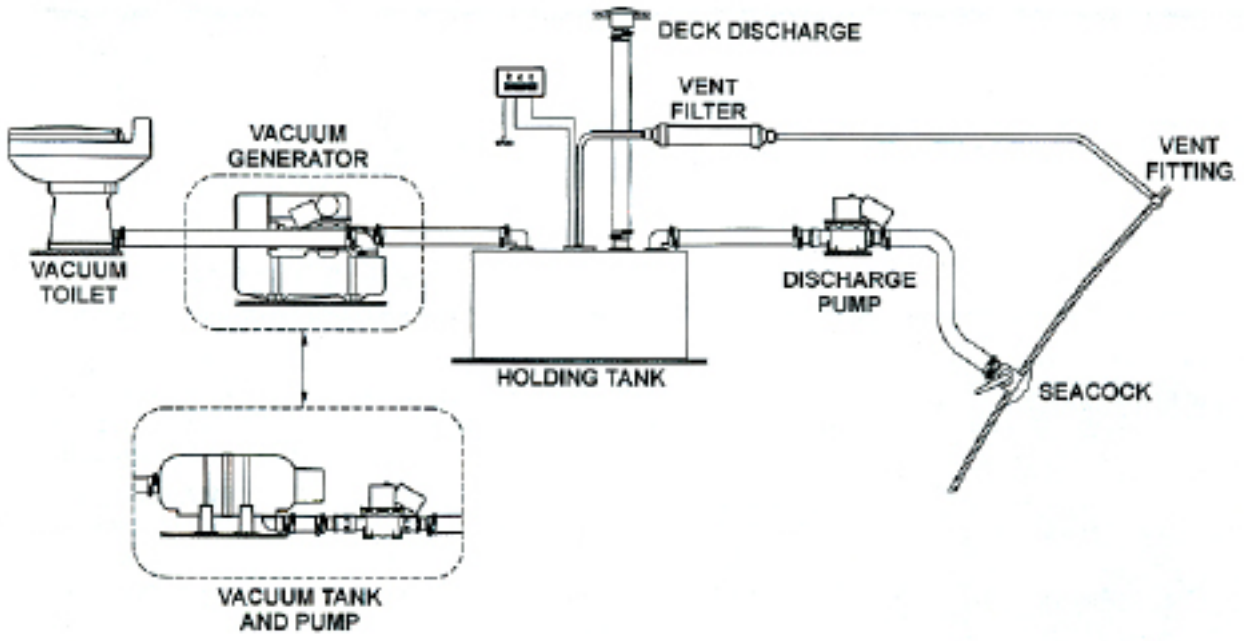
Head (Toilet) System

The onboard head system features a single toilet taking advantage of minimal water usage. It features vitreous china bowl, minimal maintenance, easy cleaning and a wall switch keyboard.
The toilet is powered by 12 volt DC electricity and is controlled by a 10 amp breaker located at the ship's main salon control panel.
Under normal conditions, the head system operates from the onboard freshwater tank. If dockside water is being used the toilets still draw water from the freshwater tank.

A Few Notations About The Head System:

- Only human waste and toilet paper should be put in the toilet. Never flush foreign materials such as paper towels, pre-moistened wipes, condoms, feminine hygiene products, dental floss or household garbage down the toilet.
- Always disconnect the dockside water system if boat is left unattended to avoid property damage due to leakage.
- Refill the toilet as soon as possible after emptying the bowl to prevent objectionable odors.
- Use only RV-Marine toilet tissues that disintegrate rapidly. Do not use household type tissues.
- If repairs are needed, use only a trained and qualified marine technician or electrician.

TYPICAL VACUUM STYLE HEAD SYSTEM



Vacuum Toilet- The Vacuflush® toilet operates in a different way from other marine toilets. The system uses around 16 ounces per flush plus a simple vacuum to complete each flush which is a substantial water savings over other systems. The toilet is connected to a pressurized fresh water supply. Fresh water is the key to an odor-free bathroom compartment. Selected other systems use intake water from wherever the vessel is sitting which may carry an odor. The Vacuflush® units are equipped with a special vacuum breaker which prevents the possible contamination of the potable water system.

Vacuum Tank- This tank stores the vacuum energy used in the system. When a switch senses a drop in the vacuum it automatically energizes the pump to upgrade the vacuum. This process in on-going between flushes.

Vacuum Pump- This unique bellows style pump is designed to handle solids without a problem. It uses two duckbill valves on each side of the pump chamber to prevent backfkow of waste and vacuum.

Vacuum Generator- This unit houses the vacuum pump and tank in one unit. It is compact over other units.

Holding Tank- Unit features polyethylene composition 50% thicker than other holding tanks. A deodorant additive is required to keep the holding tank odor-free.

In-Line Vent Filter- The vent filter is located above the holding tank. It helps keep the boat's waste vent system sanitized. Heavier-than-air malodors accumulate in the holding tank. The filter uses special charged filter media to remove the odors before they become offensive. Replace the filter each year. Contact your Regal dealer.

Fresh Water and Waste Monitor- Your vessel uses a fresh water and waste monitor panel to display the levels in each system. See the information earlier in this chapter.

Overboard Discharge Pump- An optional overboard discharge pump vacates waste through the deck waste fitting or a seacock (only used beyond the 3 mile limit in the USA).

The Vacuflush® head uses a combination of vacuum suction and water flow from the fresh water tank to clear the head of waste. Before using the Vacuflush system turn the head circuit breaker to the "on" position at the main DC control panel.
Make sure that there is always a small amount of water left in the toilet head bowl. This acts as a trap and will reduce unwanted odors.
Before leaving the boat for an extended period, flush the head for at least 10 seconds. This ensures that waste has cleared the sanitation transfer hose and has entered the holding tank.
Waste left within the transfer hose tends to dry out and harden. This could restrict the internal size of the hose and hamper future operation. The system components including the hose are formulated for the transfer of sanitary waste only. Do not allow the following items in the system: Strong acid or caustics such as drain openers, petroleum solvents or fuels, alcohol based products such as antifreeze and pine oil products along with sanitary napkins and baby diapers.
System vacuum is monitored by a switch located on the outside of the vacuum generator's tank. When the switch senses a vacuum drop, it automatically signals the pump to energize and bring the vacuum back to the operating level. This is normally a two minute process. In a properly operating system, the stored vacuum will "leak" down between flushes, causing the vacuum pump to run for a short period. This is normal. The pump should not run for more than once every (3) hours after the last flush.

To operate the Vacuflush® head:

1. Activate the head breaker on the main DC panel.

2. Activate the fresh water system breaker on the main DC panel since the fresh water tank is the main water source for the Vacuflush® system.

3. Lift the toilet lever until the desired water level is reached. Generally the system requires more water for solid liquid waste. See figure 1.

4. To flush the toilet, press the flush lever in one swift motion down to the floor until contents in the bowl disappear. A distinct popping noise is normal when flushing action begins and the vacuum seal is broken. Hold the lever down for at least 3 seconds. If flush lever is accidentally released before waste clears the bowl, do not try to flush toilet again until vacuum pump stops running. A small amount of water should remain in the bowl after flushing. See figure 2.

5. Do not dispose of sanitary napkins or other non-dissolving items in the toilet. Do not attempt to flush facial tissue, wet strength tissue, paper towels, or excessive quantities of toilet paper down the toilet. These types of items do not dissolve and cause plugging of the system.
See figure 3.

6. Make sure all passengers are aware of the toilet operation.

7. If using holding tank deodorant, use the approved ones for the system.

8. See the maintenance section for cleaning and routine inspection items.

Figure 1

Figure 2

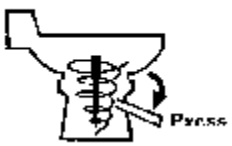


Figure 3

Typical Dockside Pump-Out

There is a fitting located on the deck labeled "waste." This fitting is used to pump out the waste tank. Normally a pump out station is found at most marinas. After removing the fitting cover a special hose is inserted into the fitting and the machine then removes the waste. Normally there is a charge for the service. Make sure they connect the hose to the "waste" fitting. Of course when cruising in international waters the overboard discharge pump may be used. See the section on using the macerator.

Holding Tank Vent Line Filter

There is a holding (waste) filter installed in the *vent* line between the waste tank and the port thru-hull fitting. See photo above. The filter's purpose is to keep objectionable odors to a minimum from the waste tank. It is recommended that the filter be changed yearly. It can be ordered from your Regal dealer or from marine supply stores. Typically the waste filter is mounted on the bulkhead aft of the galley sink area. The filter is designed with a union at each end for easier removal.

Typical Macerator (Overboard Discharge Pump)

The macerator (overboard discharge pump) option is located in the engine room. It is connected to a normally closed seacock. In locals where it is approved the seacock is opened and the macerator is activated through a key switch and button located at the ship's main salon control panel (shown above). At that point waste travels from the waste holding tank through the macerator pump where it is ground up and then exits through the hull bottom at the open seacock. See the photo.

To Use Macerator (If Installed):

☑ Make sure it is legal to pump waste overboard before starting the operation.

☑ Locate the overboard discharge seacock in the engine room. Usually this seacock can be identified by the stack of tie wraps next to it. Also, look for the incoming hose that runs from the output side of the macerator to the seacock. It is normally a 1 1/2" diameter white hose. Since the seacock by law must be have another means besides the handle to keep it closed the tie wrap serves that need. Cut the tie wrap to access the seacock handle.

☑ Open the seacock handle. It should be positioned in line with the seacock as shown in the photo.

☑ Activate the macerator breaker at the 12 volt salon main DC control panel.

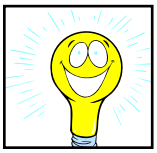
☑ At the level monitor panel shown above turn the key to the "on" position. With the key switch being held in the "on" position push in on the macerator button to start the overboard discharge. Continue to discharge the waste until the monitor panel shows empty for the waste tank. At this point, shut off the macerator switch, deactivate key switch and turn macerator breaker to the "off" postion.

Close the seacock handle. It should now be at a 90 degree angle to the seacock.

☑ Use a tie wrap and refasten the seacock handle tightly so it can not be moved.

☑ At this point you may desire to add an approved holding tank deodorant by flushing the correct amount ☑vn the toilet.

POSSIBLE PROBLEMS/SOLUTIONS-
VACUUM FLUSH SYSTEM



1. Water leaks out of toilet bowl. The seal could have something caught in it.

2. Toilets cycle every few minutes instead of once about every 30 minutes. Check system for air leak.

3. Pump emits odor. Check pump for loose hoses or connections.

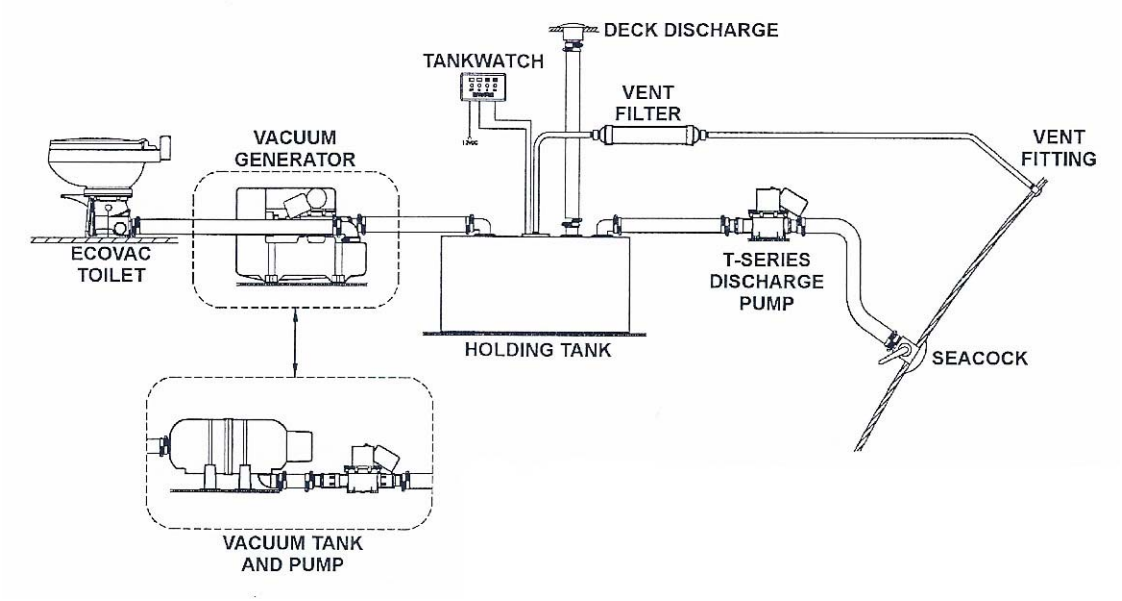
4. Toilet will not flush. Open flush valve & check orfice at the bottom of the base. Also, check vacuum pump, generator and vacuum tank for obstruction.

5. Blockage between toilet and vacuum generator. Check for foreign object in lines. Also, check for excessive toilet tissue.

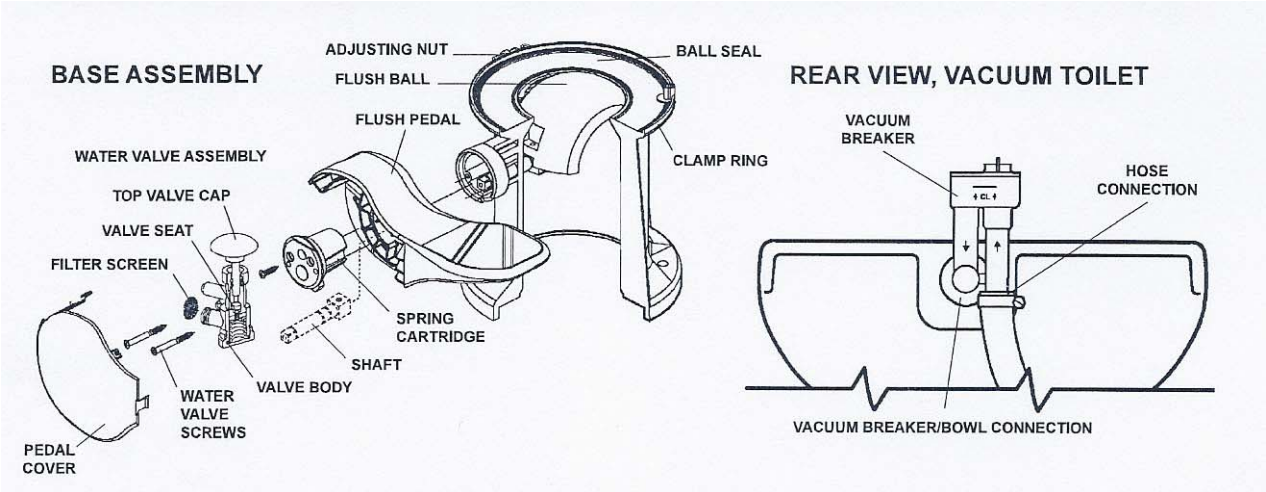
6. Water does not shut off in toilet. Check for debris in water valve.

7. Water does not enter toilet bowl properly. Make sure water supply is sufficient and breakers are activated at the ship's main control panel. Also, check the water valve for debris.

TYPICAL WASTE SYSTEM

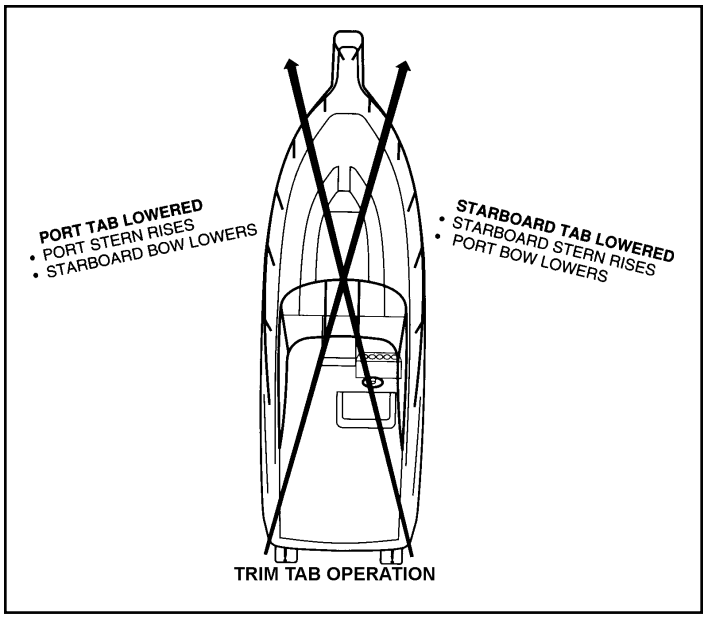


TOILET BOWL ASSEMBLY-<u>EARLIER</u> MODELS

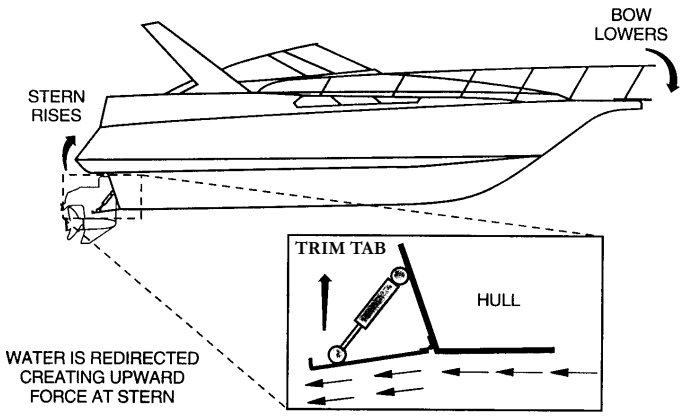


TRIM TABS

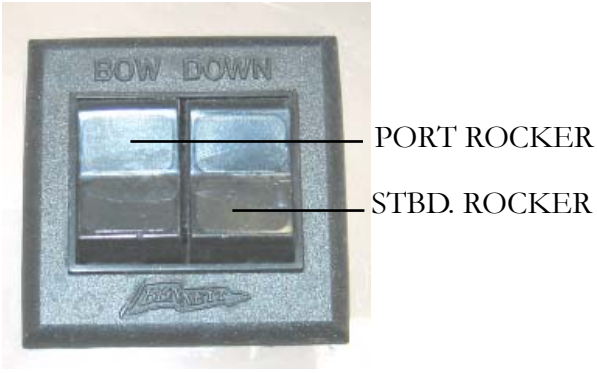
Trim tabs are installed on the lower outside transom area. Water is deflected and redirected as the trim tabs are raised and lowered from the dash switches. This change in water flow creates upper pressure under the tabs, and raises the stern. When the stern rises, the bow is lowered. Lowering the port tab will cause the port stern to rise, making the starboard bow lower. Lowering the starboard tab will cause the starboard stern to rise, making the port bow lower.



Using trim tabs will compensate for uneven weight distribution, listing, water conditions, wind velocity and other factors that cause inefficient operation.



TRIM TAB DASH SWITCH



Obtaining A Trimmed Position

Your boat reaches a planing position at a designated speed. This speed is determined by bottom design, weight distribution, water conditions, and on board equipment. As the throttle is advanced the stern squats and the bow rises initially. The trim tabs allow your boat to plane at a slower speed than natural conditions allow.

In short bursts both trim tab rocker switches are pushed simultaneously in the "bow down" position which causes the trim tabs to move down. As the boat breaks over the bow high attitude the boat speed accelerates and visibility increases.

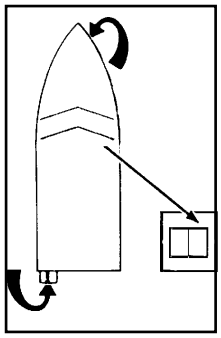
If the boat is over trimmed, it will plow the bow and the boat will lose maneuverability. If this occurs, simply short burst the "bow up" trim tab rocker switches simultaneously.

In the "learning curve" process, press the tab switches in half second bursts. You will notice a slight delay from the time the switches are pushed until the boat reacts depending on vessel speed. You will know after awhile the optimum planing angle and speed.

When running in heavy seas press the "bow down" position which will assist the vessel to cut through the waves. This will produce a drier and more comfortable ride.

When trimmed or in the bow down position, the bow spray is farther forward, the wake is smaller, and positioned further behind the vessel. Also, when trimmed you will notice that the tachometers show an increase in rpm's.

Rectifying A List



Your vessel can use the trim tabs to rectify a list. The trim tabs adjust the boat's attitude in the direction the helm rocker switch is pushed.
If the port bow is high, push the left-hand "bow down" direction on the dash rocker and the port bow will lower. If the starboard bow is high, push the right-hand "bow down" direction and the starboard bow is lowered.

Porpoising

Porpoising is a running condition where the bow "bounces" up and down similar to a porpoise motion. Press "bow down" in one-half second bursts. As the trim tabs turn, the porpoising should recede and the vessel speed should increase. Only a small amount of "bow down" is normally necessary to make this change.

TYPICAL WINDLASS

INTRODUCTION

Using the anchor windlass requires knowledge of the anchoring process to understand the correct amount of rode and scope required. Read the section on anchoring, the windlass operation manual and understand all safety information before attempting to run the windlass. Also, since anchoring is one of the skills the skipper should master for cruising "peace of mind" visit your local library or "surf" the internet to locate further information regarding anchoring techniques.

WINDLASS SAFETY TIPS & WARNINGS

- Never use the windlass to tow or pull a boat.
- Never use the windlass for securing the anchor line. Instead use a deck cleat.
- Never drop anchor in the vicinity of divers or swimmers.
- Never wrap chain around the drum.
- Never use the windlass to pull up a person.
- Never use windlass to break anchor loose.

- Always strive under normal conditions for a 7:1scope ratio on the anchor line.
- Always remove the handle from the gipsy when operating windlass from the foot controls.
- Always turn the windlass deck switch to the "off" position when not in use.
- Always secure the anchor chain lock in "locked" position in foul weather.
- Always keep an eye on the rope/chain locker to avoid rope buiding up under the hatch.
- Always manage the retrieval process carefully to prevent the anchor from hitting the boat.

⚠ WARNING

TO PREVENT POSSIBLE BODILY INJURY
KEEP ALL BODY PARTS AND LOOSE
CLOTHING AWAY FROM
WINDLASS MOVING PARTS!

⚠ WARNING

TO PREVENT POSSIBLE BODILY INJURY
TURN OFF ALL WINDLASS POWER SOURCES
BEFORE PREFORMING ANY WORK ON
ANY WINDLASS COMPONENTS!

WINDLASS ANCHOR LINE

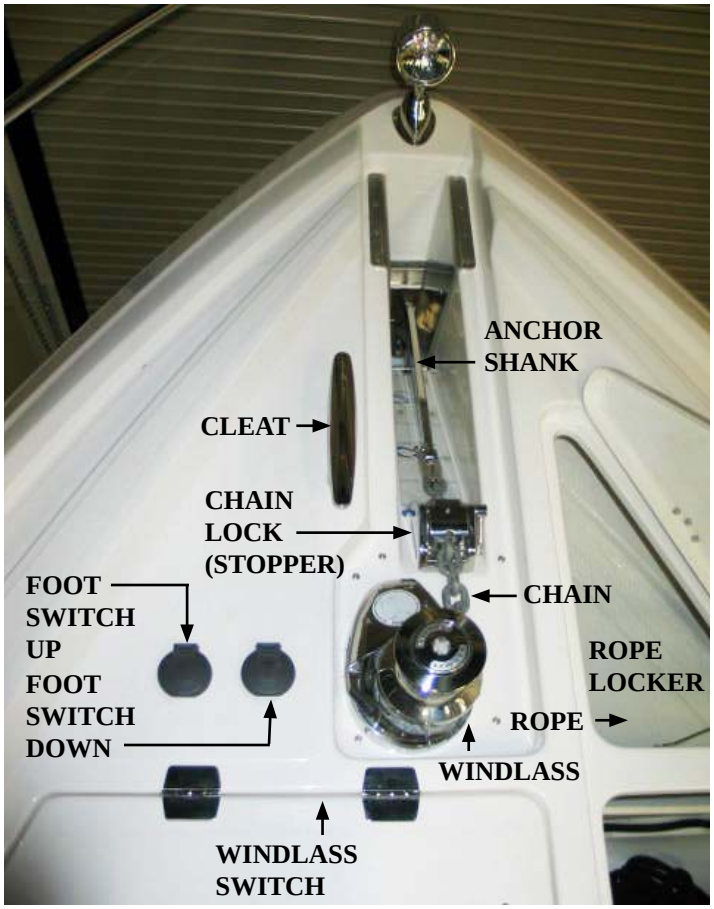
Although several variations exist the windlass is normally outfitted with 3/4 " twisted nylon line and 7/16" chain. With this combination the vessel meets normal working load conditions and the rope/chain combination protects the rode. The heavier chain lowers the angle of pull and helps bury the plow anchor which increases the holding power.

When the plow anchor is buried the chain is protected from bottom chafing as the vessel is moved around due to current, waves and wind conditions.

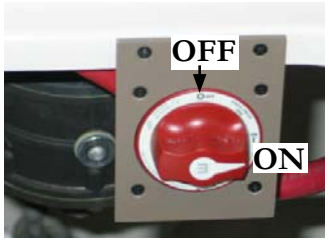
Several methods of securing the anchor to rode are used today including eye splices, thimbles and shackles. Regal uses a set of hexagon threaded pins which are lock tightened in place. This method provides a clean finish and prevents loosening due to vibration. The bolts may be removed when necessary by using a hex fitting on a ratchet wrench.

The Danforth anchor featured on your boat has demonstrated to be efficient in a variety of sea bottoms. Experts say the verdict is still out on a grassy bottom but unfortunately some grasses or weeds resist penetration by any anchor.

TYPICAL WINDLASS HARDWARE



TYPICAL WINDLASS COMPONENTS



SWITCH SHOWN IN "ON" POSITION

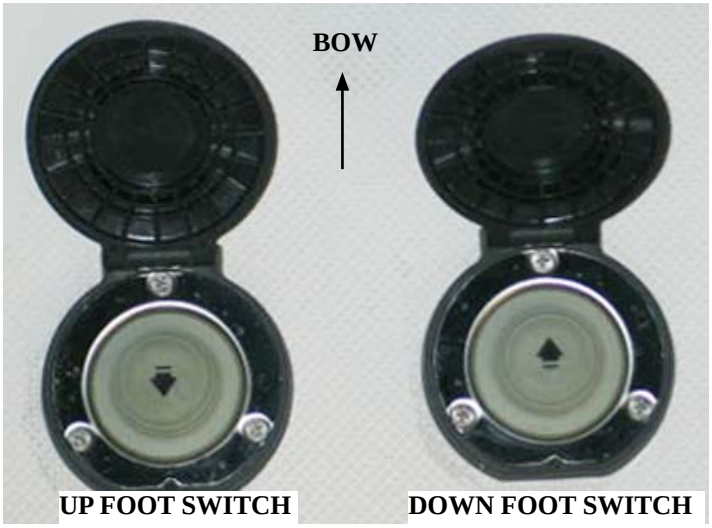
The windlass is used to automatically raise and lower the anchor. Before attempting to lower the rope/chain rode check the rope locker for tangled rope or chain. On earlier models, remove the safety lanyard from the anchor chain.

As seen in the illustration above open the deck locker to gain access to the windlass switch. The switch "off" position is at 12 o' clock. With the switch "on" position (shown above) at 3 o'clock the foot switches are energized.

The chain lock (stopper) is used to hold the chain portion of the anchor line assembly and does not effect the nylon anchor line. Before using the windlass make sure the chain lock (stopper) is positioned with the lever pointing toward the stern.

The chain lock "dances" or ratchets over the chain while the process of retrieving the anchor rode is underway. The chain stopper will lock the chain once the anchor is completely retrieved into the bow pulpit chute.

Note: Make sure the chain lock (stopper) is positioned to engage the chain once the anchor is retrieved. This prevents the chain from paying out under abnormal conditions or when a weakened gipsy clutch condition exists.



On select models bow foot switches are used to control the windlass. To use the foot switches remove the protective caps. When you energize the up foot switch the anchor is retrieved. When you energize the down foot switch the anchor is payed out. After the anchoring process is completed close the protective caps.

TYPICAL WINDLASS OPERATION

Paying Out Anchor

1. Ensure both the battery switch at the battery management panel and deck foot switch are energized.
2. Check the anchor rope locker for proper anchor line alignment. Untangle any crossed lines.
3. Check the proposed anchoring area for swimmers or divers.
4. Position vessel at proposed anchor drop site.
5. Check that pawl is in disengaged position.
6. Make sure chain stopper is in a released position.
7. Step on the **down** foot switch to pay out the chain and anchor line. When the anchor hits the sea bottom disengage the foot switch.
8. While the captain "bumps" the vessel in slow speed reverse pay out the anchor line until the correct scope is reached.
9. When scope is reached secure the anchor line around a cleat. Never use the windlass as the sole means of holding the anchor.
10. Check the anchor position by checking the postion using the GPS. The GPS features an anchor alarm. Refer to the GPS owner's manual for further information.

Retrieving Anchor

1. Check the anchor locker for any tangled lines.
2. Ensure both the battery switch at the battery management panel and deck foot switch are energized.
3. Undo the anchor line at the cleat.
4. Step on the **up** foot switch to retrieve anchor line as the captain "bumps" the vessel toward the anchor while maintaining a relatively straight anchor line position. Note: Breaker may blow if the captain does not bump the engines in gear due to the pressure on the windlass.
5. Once the vessel is over the anchor and it is broke free continue to retrieve the anchor. Check the anchor locker for tangled line and sweep the looped line out of the way if locker is filling up with line.
6. Once the anchor is approaching the bow slow down the windlass to ensure proper entrance at the chute and to avoid hitting the bow.
7. Once the anchor is completely retrieved "bump" the down foot switch to lock the chain.
8. As soon as possible after the cruise use the bow locker washdown to rinse off the anchor, chain and line. Coil the line on deck to air dry. This will aid in preventing mildew and salt deposit build-up.

Independent Warping

Once the primary rode is secure the drum can be used for docking or an additional rope only rode. To use this feature:

TYPICAL WINDLASS

•Make sure the chain lock is secured.
•Pawl to be in disengaged position.
•Disengage clutch by inserting the winch handle (mounted in deck locker) in top nut and turn counter-clockwise 1/2 a turn.
•Remove handle and store in its designated location.

- The drum will operate independently from the gipsy.
- When finished using drum, insert winch handle in top nut and turn clockwise 1/2 turn to re-engage clutch.

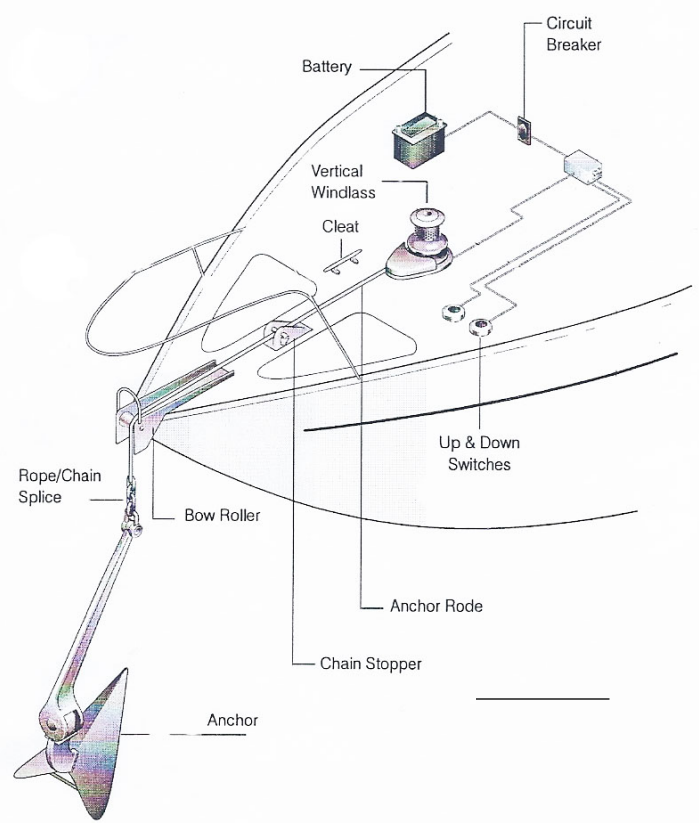
Manual Free Fall

The anchor can be dropped without the use of battery power with this feature.
To use:

- Check that pawl is in disengaged position.
- Release the chain stopper.
- Insert winch handle in top nut. Loosen top nut by turning counter-clockwise until anchor drops.
- Control the rate of fall with handle.
- Once paid out fully tighten top nut.

To avoid possible bodily injury and/or property damage read and understand the windlass operation manual before attempting to use the windlass or anchor components.

TYPICAL WINDLASS SYSTEM OVERVIEW



TYPICAL WINDLASS-SAFETY WARNINGS

♦ Ensure that limbs, fingers, hair and clothing are kept
clear of the windlass and anchor during operation.

♦ Check to see that there are no swimmers or divers nearby before dropping the anchor.

♦ Remove the handle from the gipsy when operating the windlass from the foot controls or helm switch power.

♦ Always turn the windlass power suppy to the "off" position when not in use.

♦ While at anchor, the load on the chain/rope must be transferred to a cleat.

♦ Do not use a windlass as a holding device for towing.

♦ Never use a windlass to lift a person, boat, etc.

♦ Check to make sure the permit switch is locked when the windlass is not in use.

♦ Remove the anchor safety lanyard before powering up the windlass.

♦ Fasten the anchor safety lanyard immediately after the anchor is positioned at the bow.

♦ Do not attempt to pull a load greater than the rated load of the windlass.

♦ Always use the vessel's engines to aid anchor recovery.

♦ Refer the the windlass manufacturer's owner manual for more detailed operating and maintenance information.

TYPICAL ENTERTAINMENT SYSTEM

OVERVIEW

Your vessel features a variety of standard components that provide both visual and audio entertainment. In addition, there are optional systems that are noted in the following pages. **Regal reserves the right to delete, add, or change both standard and optional components at anytime without notice.**
Note: The information found in the following pages is for current models only.
Please refer to the individual owner's manuals and the technical section (schematics) for further entertainment system information.

Preparing To Use Entertainment System-Breakers

Before using any portion of the salon stereo based system it is necessary to activate the 12 volt stereo breaker at the ship's main DC panel.
Also, depending on the entertainment component desired the following breakers may need to be activated:

DC main ship's panel- TV Antenna

Become familiar with each of the entertainment component owner's manuals which are located with the owner's information packet.
Note that a portion of the equipment may not be installed on your yacht since that component may be optional.

Antenna Switch

The antenna switch features 2 buttons labeled A and B to choose the desired antenna signal source. It is located inside the aft salon entertainment center overhead cabinet. See the salon entertainment system layout on the following page.

Note: Activate the TV antenna breaker. Follow the instructions below.

At Dockside- After the television coxial cable is plugged into the vessel coxial receptacle and the marina dock box press the **A** antenna switch button completely in until it catches. At this point the marina TV signal is available to view onboard televisions.

At Sea- Press the **B** antenna switch button completely in until it catches to activate the saucer-shaped television antenna mounted on the hardtop.

To deactivate either antenna switch, push the switch completely in; then release.

When cruising you may encounter a marina without a working shore signal so your backup is to use the ship's antenna. This is more common with older marinas located off the more traveled waterways.

A/B ANTENNA SWITCH

Salon Flatscreen Television

Featured in the salon is a 32" LED television with DVD player. Refer to the television instructions in the owner's information packet on the use of the remote control.

The DVD player provides a pathway for movies to be viewed on the television. Also, the DVD player can be programmed to play music independently of the television through the speaker system using aux. input.

DVD-CD's

Checking For Disc Compatibility

If you encounter a problem when attempting to play a disc, check to make sure it is one of the compatible types as shown below.

- Video DVD
- Video CD
- DVD-R, DVD-RW
- Audio CD
- CD-R
- SACDs (CD-compatible content only)
- MP3 CDs:
  - burned in a single closed session
  - in disc format ISO9660
  - with .mp3 as the extension and no other periods in the file name.

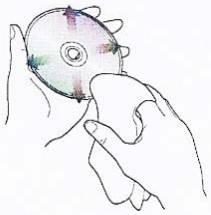
Disc Care

Dirt or scratches on a disc can prevent it from playing properly.

You can avoid this problem by:

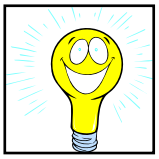
1. Handling all discs by their edges to prevent fingerprints and scratches. Return them to their cases after use.
2. Avoiding exposing discs to chemical products that can cause damage
3. Writing directly on a disc or on a label attached to the disc.
4. Direct sunlight, high temperatures, and humidity.
5. Always use a soft, dry and lint-free cloth to clean the disc. Wipe straight out from the center to the edge.

WIPE STRAIGHT OUT



DO NOT USE A CIRCULAR MOTION

POSSIBLE PROBLEMS/SOLUTIONS



1. TV channels using the master remote control are sluggish to change or will not change up or down.

Change out the remote control batteries.

2. After a cruise and hooking up coaxial cable to the dock box the on board television sets do not display a picture.

Check to make sure the A/B switch is in the shore position.

TYPICAL STEREO

The stereo is normally located in the salon. The unit features an iPOD inside the waterproof cover.
See the Fusion owner's manual for further information.

TYPICAL ELECTRONICS

Express cruisers feature Garmin electronics. *If installed, the package may include* chartplotters, heavy duty closed-array radar, VHF radio with DSC capability and XM satellite weather radio. Operating information for electronics can be found at www.garmin.com or in the owner's information packet.

Note: A portion of the components are optional and may not be installed on your vessel. Earlier boats may have different systems and/or components onboard.
Please refer to each vendors owner's manual for in-depth information regarding individual electronic components.
Regal reserves the right to upgrade, change, modify, or eliminate any system or component at anytime.

System Operation Overview

To operate electronics the following switches need to be activated:

1. Make sure the battery switch is activated. To perform this function turn the "house" battery switch to the "on" position.

2. Activate the "electronics" switch at the helm panel which controls power to the GPS antenna.

3. At this point each individual component can be activated.

Chartplotter

A single chartplotter is standard on your vessel. The unit-features a touchscreen, NMEA 2000 compatible, multi-function display, pre-loaded with U. S. coastal maps and interfaces with other electronic components through the Garmin Marine Network. It displays graphics with crisp, video-quality resolution. With the dual chartplotters and the optional camera monitoring system, you can keep tabs of your main salon and deck activity.

Chartplotter Operation

Before operating the chartplotter read and understand the vendor supplied owner's manual including all the warning information. As mentioned before some yachts display the optional dual chartplotters.
The chartplotter features a "touch" screen. When you see information groups on the screen use your finger to touch the format desired. With some information in particular it is required that you actually drag an object by using your finger and keeping it on the screen as you move the object.

A. To power the system up turn the "house" battery switch to the "on" position.

B. Next, turn the helm electronics switch to the "on" position. This powers up the GPS antenna. The chartplotter is now ready to power up.

C. Press and release the chartplotter power key. When the warning screen appears, touch I agree. At this point you will be taken to the home page screen.

Home Screen

Charts- Selects navigational charts and radar overlay functions.

Sonar- Sets up and provides sonar information through the optional transducer.

Combinations- formats screen to view a chart, sonar, radar, and video cameras (2 cameras on each chartplotter; requires the extra chartplotter option).

Information- Shows tide conditions, currents, celestial data, information about other vessels, your yacht's instrumentation, and video.

Mark- Marks, edits, or deletes your current location as a waypoint or Man Overboard

Where To?- Searches and navigates to service areas, routes and waypoints.

Radar- Sets up and displays radar (requires open array radar option) Radar unit is installed on hardtop.

Weather- Sets up and displays various weather information including precipitation, forecast, fishing, sea conditions, and visibility (Only available with the satellite weather option and subscription).

Configure- Permits the editing of chartplotter system settings (Can set a simulator mode where you can practice using most of the chartplotter functions).

Man Overboard- Marks your current position as a waypoint, and sets a course back to the marked location.

Once you are able to navigate to the home screen each of the electronic onboard components can be formatted and adjusted to meet individual needs and the finer points of cruising requirements. Continue to read the electronic owner's manuals for adjusting the finer settings on the chartplotter.

Typical Radar

Since the radar unit is part of the optional vessel electronic marine network you will be able to use the chartplotter as your network screen and have the capability to overlay the radar image on the chartplotter map page with the radar option.

WARNING

RADAR PRODUCES ELECTROMAGNETIC ENERGY WHICH IS HARMFUL.
TURN THE RADAR OFF WHEN PERSONNEL ARE SERVICING THE UNIT OR EQUIPMENT CLOSE BY.

CAUTION

AVOID POSSIBLE DAMAGE TO THE EYES DUE TO ELECTROMAGNETIC ENERGY.
WHEN RADAR IS TRANSMITTING
DO NOT LOOK DIRECTLY AT THE ANTENNA AT CLOSE RANGE.

Radar Operation

If installed, read the radar operator's manual for learning all the features of the radar component. It is a good idea to use the manual along side the chartplotter to learn the basic radar operation. At that point you can branch out with the manual on the secondary functions of the radar. Pay special attention to all safety and warning labels in the operatior's manual.

Typical Satellite Weather

If installed, satellite weather features a weather receiver located in the forward deck rope locker area. It looks like a hockey puck. The receiver sends satellite weather information to the chartplotter for display. Along with the receiver an active subscription is required to receive satellite weather.

The weather information is received from reputable weather data centers such as the National Weather Service and the Hydrometerological Prediction Center. Since weather information is broadcast at five second intervals the weather receiver must obtain new data before it can be shown. Therefore, there might be a delay before new weather data appears on the map.

Read and understand the XM weather information located in the chartplotter owner's manual before attempting to use the weather option.

Typical Sirius XM Satellite Radio

If installled, Sirius satellite radio features over 120 channels of music entertainment completely commercial-free along with sports and news channels. Sirius emphasizes the music and entertainment you want. Channels use the most updated digital filtering available for the clearest sound. Sirius uses three satellites flying over the United States for coast to coast coverage with high elevation angles. The result is a clearer line of sight and less signal blocking.

The system consists of the stereo receiver (sometimes called the head unit), Sirius radio tuner and antenna. With these components and an active account your Sirius system can be activated. Following are the activation steps to be taken:

A. Unit must be completely installed and the antenna must have a clear view of the sky.

B. Turn on the radio and go to satellite mode.

C. Confirm reception by tuning to SIRIUS WEATHER & EMERGENCY//CHANNEL 184. If you are not receiving Channel 184, please refer to the radio manufacturer owner's manual.

D. Call SIRIUS sales support 1-866-580-7234 or customer care 1-888-539-7474

E. Please have your name, address, phone number and the SIRIUS ID#ESN available for the agent.

Typical Engine Management System

If installed, the digital gauges can be displayed on the chartplotter(s) through the home screen. *Touch information, helm gauges and engine menu.*
Also, at the home screen helm gauges can be accessed by *touching combinations*. From the next screen, pick the desired combo. *Go to menu, change combination and choose the desired function 1-4*.
By using the > and < symbols you can access the different gauge combinations and choose the one gauge screen or multiple gauge screens for that function.
Read and understand the chartplotter owner's manual before attempting to operate the vessel using these chartplotter functions.

Below are several combinations showing gauge function samples.

Read and understand the chartplotter owner's manual before setting the engine management function to gain insight into the engine gauge screen selection process.

Typical VHF Marine Radio

The standard VHF marine radio features up to 25 watts of transmitting power and DSC capability. There are dedicated soft keys linked to a screen to select and view the information the yachtsman needs.
The radio is interfaced to the chartplotter which permits you to obtain mayday signaling and a digital broadcast of your boat's position. The unit offers premium sound quality so each message is loud and clear. Also, the VHF receives NOAA weather alert information.
Read and understand the vendor supplied information on the operation of the unit. Be sure to train a crew member on how to use the component should the captain become unable to carry out his duties.

Engines & Controls

OVERVIEW-PROPULSION

This chapter introduces the vessel's propulsion system. This is not to be thought of as a complete workshop manual. This manual will highlight a portion of the engine and propulsion information. *Read the Volvo or MerCruiser engine manual carefully and understand the operation as well as the necessary maintenance requirements of the engines and related drive system components before operating the vessel.*

Always begin maneuvering in a controlled environment where you can practice shifting and docking operations at your own pace. Learn how the vessel's engines and propulsion systems behave at different speeds, in varied sea conditions, and under light and heavy loads. Always keep the safety of others in mind as you practice docking and maneuvering.

Learn to monitor the helm gauges, electronic equipment, and warning systems as they are your on board friends. Read all safety labels and practices. Review with a crew member all the component operations in case the captain would became unable to carry out his duties as skipper.

Note: Your Regal dealer has been factory trained on the various boat systems. Consult your Regal dealer for further information regarding technical support and parts.

WARNING

AVOID SERIOUS INJURY OR DEATH!
READ ALL MANUFACTURER'S ENGINE AND PROPULSION MANUALS BEFORE STARTING OR OPERATING THE VESSEL.

CAUTION

NEVER RUN ENGINES WITHOUT WATER. DAMAGE TO THE WATER PUMP, IMPELLER, AND OTHER ENGINE PARTS WILL OCCUR.

ENGINE BREAK-IN: ALL MODELS

Propulsion systems require a pre-determined "break in" period. During this time the engine should not be run at a full load condition for extended periods. Various engine load and speed conditions assist the internal engine parts such as bearings, valves and piston rings to "seat" properly which will help ensure a longer engine life. See operator's manual for further information.

During the "break in" period it is necessary to check the engine oil more frequently since it is normal that the engine will use more oil. If engine oil is required be sure to check the engine manual for proper grade and viscosity.

Check the maintenance schedule in your engine owner's manual and contact your Regal dealer to set up the first maintenance inspection. Normally the engine oil, filters, and drive oil inspections and maintenance are performed during this inspection along with other items. Never exceed the recommended period between oil changes especially with diesel power since sulfur tends to enter the lubrication system through the fuel combustion process over a period of time.

OIL CHANGES (ENGINE & DRIVE)

Be sure to read the owner's manual regarding engine oil change recommendations.Be sure to follow the manufacturers recommended oil type and viscosity. The engine oil change is an important factor in obtaining engine longevity since impurities enter the crankcase through the combustion process and build up in the engine oil.

Be sure to check the drive oil on a periodic basis and change it according to the recommended schedule using the specified type per the engine owner's manual.

ENGINE MOUNTS

The engines are placed in the boat on a set of metal or wooden platforms called mounts. These rubber isolation mounts keep the engine from moving laterally and athwartships (right angles to the center line). The mounts help reduce the vibration caused by the engine and drive. Periodically, the mount hardware should be checked for tightness by your authorized Regal dealer.

ENGINE ALIGNMENT

Selected stern drives use a rubber splined hub to which the stern drive shaft is attached. There is an alignment specification between the engine and stern drive that needs to be checked periodically. A special alignment shaft is greased at the tip and inserted through the gimbal housing with the drive unit removed from the vessel. The alignment angle can be determined by the spline image left on the tool. The engine mounts are then adjusted to obtain a spline image mirrored 360 degrees around the greased alignment tool. This specification should be checked after each 50 hours of operation or if the vessel has run aground or hit a submerged object. Alignment should be checked by a Regal dealer or marine professional since a special tool and procedure is required. Refer to your engine manual or contact your authorized Regal dealer for additional information.

ENGINE REMOVAL

In the event the engine requires major service and needs to be removed, consult your Regal dealer. The dealer posseses the knowledge,factory training and special tools necessary to accomplish such a job. Do not undertake this type of repair yourself.

ENGINE VENTILATION

Ventilation Ducting

With all engines large amounts of air are required to perform the combustion process. The higher the revolutions per minute of the engine the more air is required to meet the demand.

Most engines exhaust large amounts of natural incoming air by mixing it through the combustion process and forcing the air through the engine exhaust system into the water. The same deck cowlings are used to funnel incoming air for combustion. The remaining air exits through the cowlings into the atmosphere.

This "breathing cycle" occurs naturally within the engine with more oxygen being required as the throttle speeds are increased.

With gasoline engines a powered ventilation system exhausts sump fumes through a set of hoses in the lower third of the bilge overboard. The process initiates with the blower switches. Besides using the bllowers always open the hatch and use your nose to sniff for gas fumes Always use the blower switches for at least 4 minutes before starting the engines. Keep the blowers energized through cruising speeds.

As part of maintenance, ensure the cowlings are free of debris including animal nests such as wasps and birds. Check and replace the engine air filters as required.

Also, it is recommended that after a cruise you let the engines and generator idle under a 'no load' condition for several minutes. Perform a visual check for exhaust and fluid leaks in the bilge. Since there is a light gelcoat color in the bilge bottom it will be easier to spot any fluid leaks.

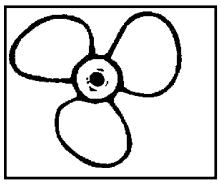
WARNING

BEFORE STARTING ENGINES
"SNIFF" ENGINE COMPARTMENT
FOR FUEL LEAKS.
ACTIVATE BLOWERS FOR AT LEAST 4
MINUTES BEFORE STARTING ENGINES.
RUN BLOWERS BELOW CRUSING SPEEDS.

WARNING

TO PREVENT FIRE OR EXPLOSION
DO NOT STORE
FLAMMABLE LIQUIDS IN CONTAINERS
ANYWHERE ON THE VESSEL!

ENGINE/DRIVE PROPELLERS



We have carefully tested and chosen the propellers to give your boat the best possible performance and have allowed for the additional weight in equipment that might be added to the boat.

Carry the necessary tools in order to handle an emergency propeller change. Carry a set of extra propellers and hardware. Always use genuine replacement parts which can be ordered from your Regal dealer.

Many times a boater is cruising far from his mooring when he needs emergency repairs. A facility may be able to sling your vessel for propeller changing but may not have the special hardware or correctly sized propellers for your vessel. **Be prepared!**

Sterndrive propellers are balanced to achieve the highest performance standards along with running a straight course with no power steering torque.

DANGER

PREVENT SEVERE INJURY OR DEATH!
SHUT OFF IGNITION SWITCHES
NEAR SWIMMERS
TO AVOID ROTATING PROPELLER BLADES.

NOTICE

NEVER CONTINUOUSLY RUN WITH A DAMAGED PROPELLER SINCE TRANSMISSION AND/OR ENGINE DAMAGE COULD RESULT.

To check the propellers the drives must be lifted using the trailer postiion or the vessel can be lifted using a hoist with proper type slings that are specified for larger vessels. Make sure you read and understand the proper procedures for slinging the vessel before attempting to hoist your yacht. There are 2 sets of "sling" identification deck markers. The markers provide a safe lifting location for sling straps. Make sure the slings used are wide enough to support the boat weight.

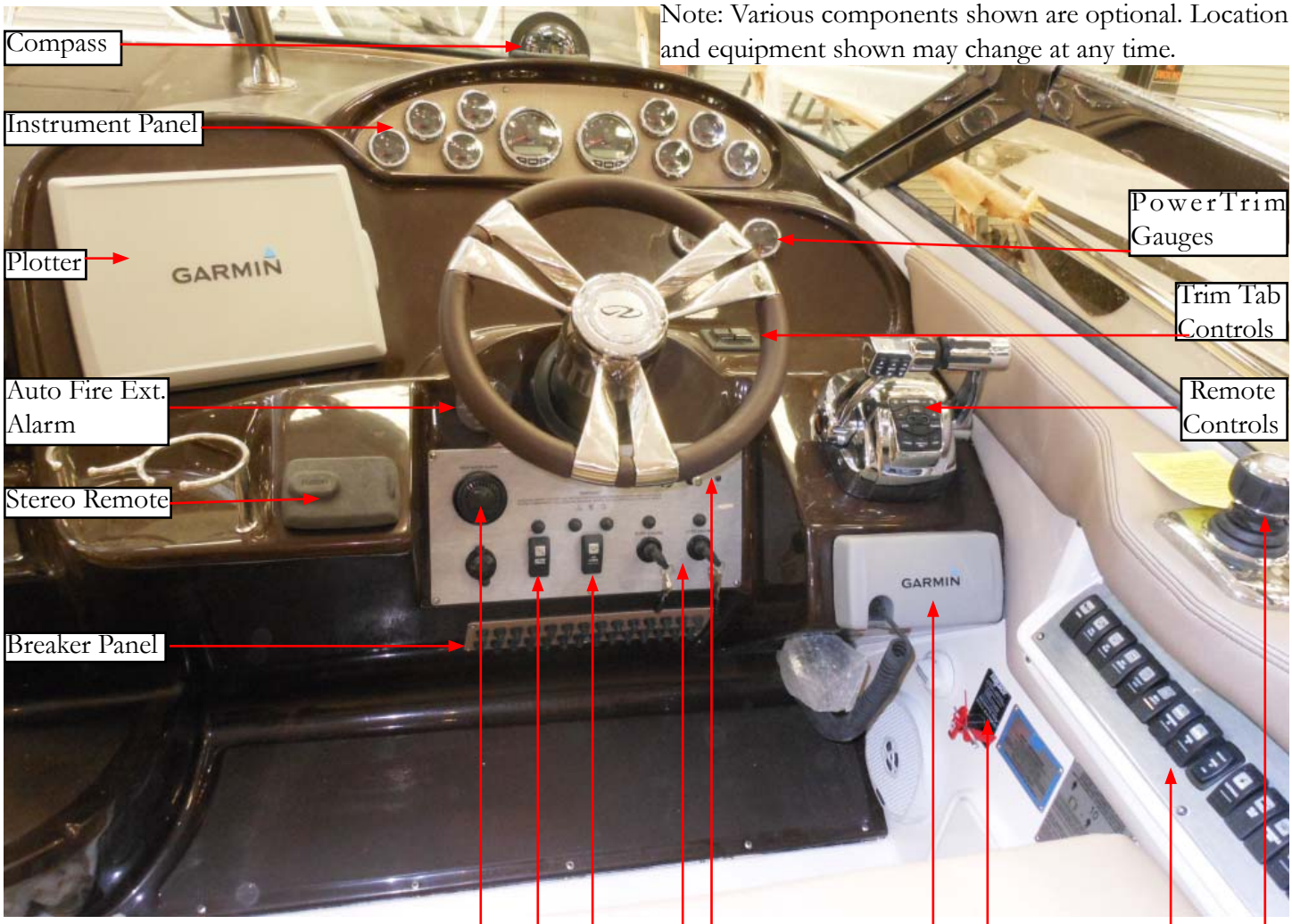
After the propellers are removed they can be sent to a propeller repair facility to check balance and recondition the blades.

Also, the drive anodes can be checked/changed when the boat is out of the water. Use emery paper to clean oxidized anodes not a wire brush.

A spare set of propellers can be installed while the original set is being repaired. Refer to the engine operation manual for further detailed information regarding the changing of propellers.

TYPICAL HELM OVERVIEW

Note: Various components shown are optional. Location and equipment shown may change at any time.



TYPICAL INSTRUMENTATION

Your helm station (dash) is equipped with a set of instruments (called gauges) specifically designed to monitor the condition of the propulsion components and other onboard components. Close observation of the gauges is the responsibility of the captain while cruising. Periodically scan the gauges for the appropriate meter level deflections. Other instruments called displays present digital information verses needle deflection.

Note: Gauge displays vary by engine brand and type.

Become familiar with all the gauge functions and their normal operating specifications as outlined in this manual and the engine operation manual. Gauge deflection (movement) on boats is very similar to automobile gauges.

After educating yourself in the functionality of the instruments be sure to train another person as the skipper's backup. This person should know how to read the gauges and how to respond to system "fault" codes should they occur.

GAUGE OPERATION (TYPICAL)

Tachometer

The digital tachometer (tach) indicates the speed of the engine in revolutions per minute (rpm). *Select* tachometers display the engine running hours. Note that engine hours is the gauge for marine maintenance schedules. Pay close attention to the hours of running displayed on the tachometer and the recommended system maintenance as found in your engine operator's manual.

Fuel Gauge

The fuel gauge indicates the level of fuel inside the fuel tank. It is a good idea to keep the fuel tank "topped off" when possible to reduce condensation inside the tank. Do not run the fuel level close to empty. Figure in an adequate "safety" factor (1/3 rule) when monitoring fuel gauges since they are not entirely accurate.

Oil Pressure Gauge

The oil pressure gauge indicates the pressure of the oil inside the engine lubrication system. A drop in oil pressure may be an indication of a low oil situation or a leak. Operation of the engines with low oil pressure could lead to engine damage. Should a low oil pressure situation develop shut down the engine immediately and investigate the problem. Refer to the engine operation manual for more information or contact your Regal dealer.

Temperature Gauge

The temperature display monitors the cooling system of the engine. A sudden increase in the temperature could be a sign that the engine cooling system is malfunctioning. Shut down the engine immediately and investigate the problem.

Volt Gauge

The voltage gauge indicates the battery condition as well as the alternator performance. Normal voltage is between 12.0 and 15.0 volts. Readings outside of this range may indicate a charging system or battery problem.

Typical EVC Helm Display Panel

If installed, select dashes feature EVC-D dual top mount multi-functional display gauges. These 2.5" gauges display detailed engine information and settings along with diagnostic codes and warnings. Also, trip computer information can be displayed. The port gauge displays port engine related data as programmed and the starboard gauge displays the starboard engine information. The information works alone or in combination with other helm related gauges.

Engine information displayed includes engine speed, oil pressure, coolant temperature, and battery voltage.

Note: If a fault message appears it must be acknowledged by pressing the display button. If the fault sounds an alarm both will cease to exist when the button is pressed.

When a fault message appears, use the display panel to gather additional information on the fault. The Volvo operator's manual offers detailed fault diagnosis.

CAUTION

TO PREVENT ENGINE DAMAGE IN THE EVENT OF AN ALARM LAMP FLASHING IMMEDIATELY SHUT DOWN THE ENGINES AND CHECK FOR A SYSTEM MALFUNCTION!

NOTICE

BECOME FAMILIAR WITH THE ENGINE FAULT CODE SYSTEM. SHOULD A ENGINE MALFUNCTION ARISE THE OPERATOR WILL BE ABLE TO REACT FASTER TO THE SITUATION.

NOTICE

FOR BEST USAGE OF THE EVC DISPLAY ALWAYS PRESS THE BUTTONS FIRMLY, AND FOR AT LEAST 1 SECOND EACH TIME.

High Water Alarm

Using a bilge float sensor this component determines a high water bilge situation and sends a signal to the dash alarm. This may indicate that a large amount of water has entered the hull or there is a leak in the engine water circulation system and the bilge pump cannot evacuate water overboard fast enough or has failed to operate. Periodically, activate the bilge pump manually to check operation.

Automatic Fire Ext. System

Utilizes an instrument display unit (gauge) that provides the operator with a system status of a charged or uncharged condition by an audible alarm. With the ignition switch on and no light indicates that the system has been discharged.

If the system should discharge the ignition system will be instantaneously interrupted. Should this occur shut down the engine and any electrical system components along with closing any open hatches.

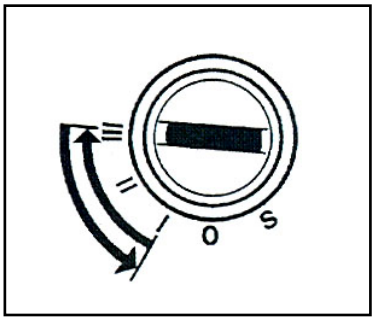
If a fire has started in the engine compartment find the system manual cable assembly located at the helm.

Remove the safety pin from the "Fire T Handle" and pull firmly on the "Fire" handle which will activate the fire extinguisher unit in the engine compartment. A loud "rushing air" sound may be heard. Complete discharge will take several seconds. Keep the compartment closed for a period of time sufficient to permit the agent to soak all areas of the protected space. This allows hot metals and fuel time to cool. Refer to the manufacturer's owner's manual for additional information.

TYPICAL KEY SWITCH-TYPICAL

Ignition switch type features the following markings to identify key operating positions:

S= Stop
O=To Remove the key
I= Operating Position
II-III=Start (Spring Loaded)



NOTE: Turn the ignition key to the "OPERATING" position and then to the "START" position. At this point the key can be released and the engine will crank until it starts. The starter is automatically disengaged when the engine starts. To stop the engine, turn the key to the "S" position. Keep the key turned until the engine stops. Since this position is spring loaded the key will return to the "O" mode where it can be removed.

NOTICE

WITH THE ELECTRIC BATTERY SWITCHES IN THE "OFF" POSITION THERE IS NO POWER TO THE DASH KEY SWITCHES.

TYPICAL ELECTRONIC CONTROLS

VOLVO CONTROL SHOWN

ICON DISPLAY

MerCruiser- General Button Functions

Below is a general description of the Volvo electronic control functions found on EVC engines. Consult you engine operator's manual for more in-depth information.

Station button- featured for multi-station boats. Since this vessel features one helm the station button lights up "green" when the control is activated but this function can not be configured.

Throttle Only button- when pressed it disconnects the shift function. At this point the control lever only effects the engine speed.

Low Speed- This function reduces the low speed engine capability.

Cruise Control button- when pressed it permits the operator to fine tune by increasing or decreasing engine rpm with the button on the forward side of the control. Use the arrows on the button to increase or decrease engine rpm.

Other indicators- On the port and starboard sides of the control various icons may be displayed including the following:

Neutral position- This symbol shows that the engine and drive are disengaged.

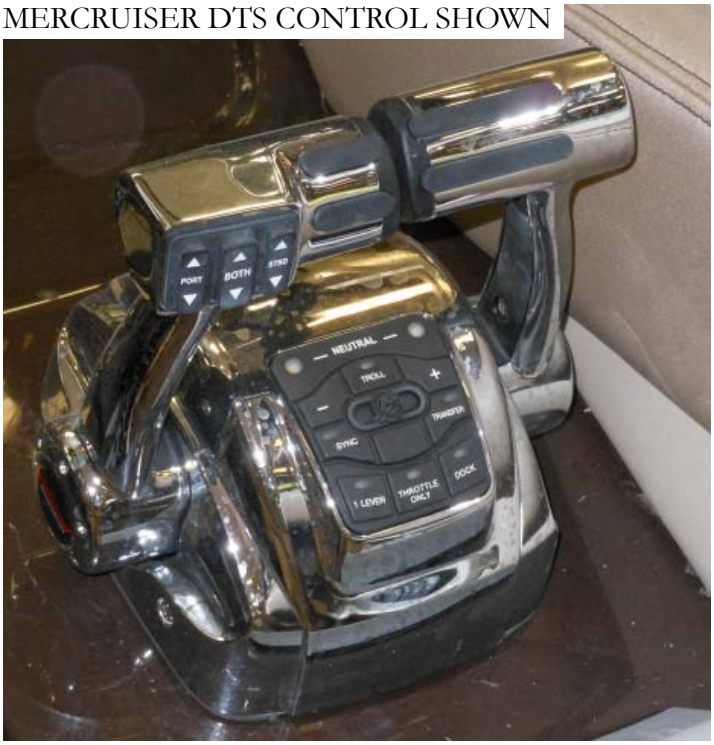
Warning triangle- This symbol lights up when a system fault is recognized. It will project on the side where the driveline with the problem exists.

Select controls offer several button options which can be added through the retail dealer who orders the needed software from the engine manufacturer.

For more detailed information refer to your engine operator's manual or contact your closest Regal dealer.

MerCruiser- General Button Functions

MERCRUISER DTS CONTROL SHOWN



Below is a general description of the MerCruiser electronic control functions. Consult you engine operator's manual for more in-depth information.

The Axius electronic control system converts manual control movements to digitial readings which tell the engines how to maneuver.

Trim button- The port handle offers power trim with 3 functions available: port engine trim, starboard engine trim, and a button that synchronizes both drive's trim.

Syn- Allows the use of one control handle to throttle both engines. With both engines running over 1500 rpm's when the syn button is pressed you put the port handle in the neutral position and press the 1lever button. Now the port handle controls both engine throttle functions and you can put the stbd. handle in an out of the way position.

Throttle Only- When the button throttle only button is depressed, put both throttles in neutral and push the handles forward as desired for throttle only positions.

Dock Mode- When actuvated the system cuts power by 50% for docking situations. Basically it provides "room for error" assisting in tight maneuvering.

Transfer- This button is used for more than 1 station and therefore is not used currently on Regal products.

NOTICE

PRACTICE YOUR REMOTE CONTROL SHIFTING AT AN ON THE WATER ENVIRONMENT WITHOUT HEAVY BOAT TRAFFIC.

TYPICAL JOYSTICK CONTROL OPTION

Using Volvo Joystick Control Docking Mode Function

When using the joystick for docking the engine rpm scale is limited and the boat can only be steered with the joystick.
For the docking mode to be activated the engines must be running, the remote control levers must be in the neutral position, with an active helm station, and the joystick handle must be centered.

First, **activate** the docking mode on the joystick by depressing the "docking" button (A). You will hear an audible signal confirming the docking function is activated along with a button lamp being energized. The joystick is now the control for docking and low speed maneuvering.

Next, to deactivate the docking mode depress the docking button on the joystick. Again, an audible signal will sound twice to confirm that the joystick docking mode is now deactivated and the docking button light will go out.

Note: If the remote controls are moved from the neutral position the docking function will deactivate.

NOTICE

USE THE JOYSTICK ONLY IN DOCKING SITUATIONS. USE THE STEERING WHEEL AND CONTROLS IN ALL OTHER APPLICATIONS.

Using Volvo Joystick Control High Mode Function

Sometimes a strong wind or current will need to be offset by engaging the high mode function at the joystick control. Once activated the engine idle will increase. This feature can be especially useful when trying to dock or maneuver in tight areas.

To use the High Mode Function;

1. Activate the high mode by pressing button (B) on the joystick (see the illustration).

2. You will hear an audible signal indicating the docking mode is activated and the docking lamp above the high mode button will light (see illustration).

3. At this point the vessel can be maneuvered by moving the joystick fore and aft, sideways, or rotating the vessel by twisting the joystick top. See the illustration on the following page.

4. Leave the high mode function by pressing button (B). An audible signal will sound twice to confirm that the high mode function is deactivated and the light will go out.

5. The system is now in normal docking mode not connected to the joystick control.

The joystick features a DPS (dynamic positioning system) button **option** which can be activated through the retail dealer who can order the needed software from Volvo.
The DPS feature assists in retaining a selected position and compass heading from the vessel's GPS signal. This can be beneficial while waiting for a dock or a bridge to open or to remain over a favorite fishing or diving location.
When employing this feature the operator must maintain helm control since legally the vessel is considered to be under way. Also, keep several boat lengths away from swimmers, other vessels and objects.

For more detailed information refer to your engine operator's manual or contact your closest Regal dealer.

• The joystick is for boat docking and low speed maneuvers.
• Use the joystick only when the ERC controls are in neutral.
• When the ERC controls are shifted into gear, the joystick disengages.
• To limit engine power during docking and maneuvering, engage the dock feature by pressing the DOCK button.
• To prevent the boat from being shifted into gear during operation and to disengage the joystick, engage the throttle-only feature by pressing the THROTTLE ONLY button.
• For complete details of features and operation, please refer to the operation, maintenance, and warranty manual.
90-879288287

Using MerCruiser Axius System- Joystick Control

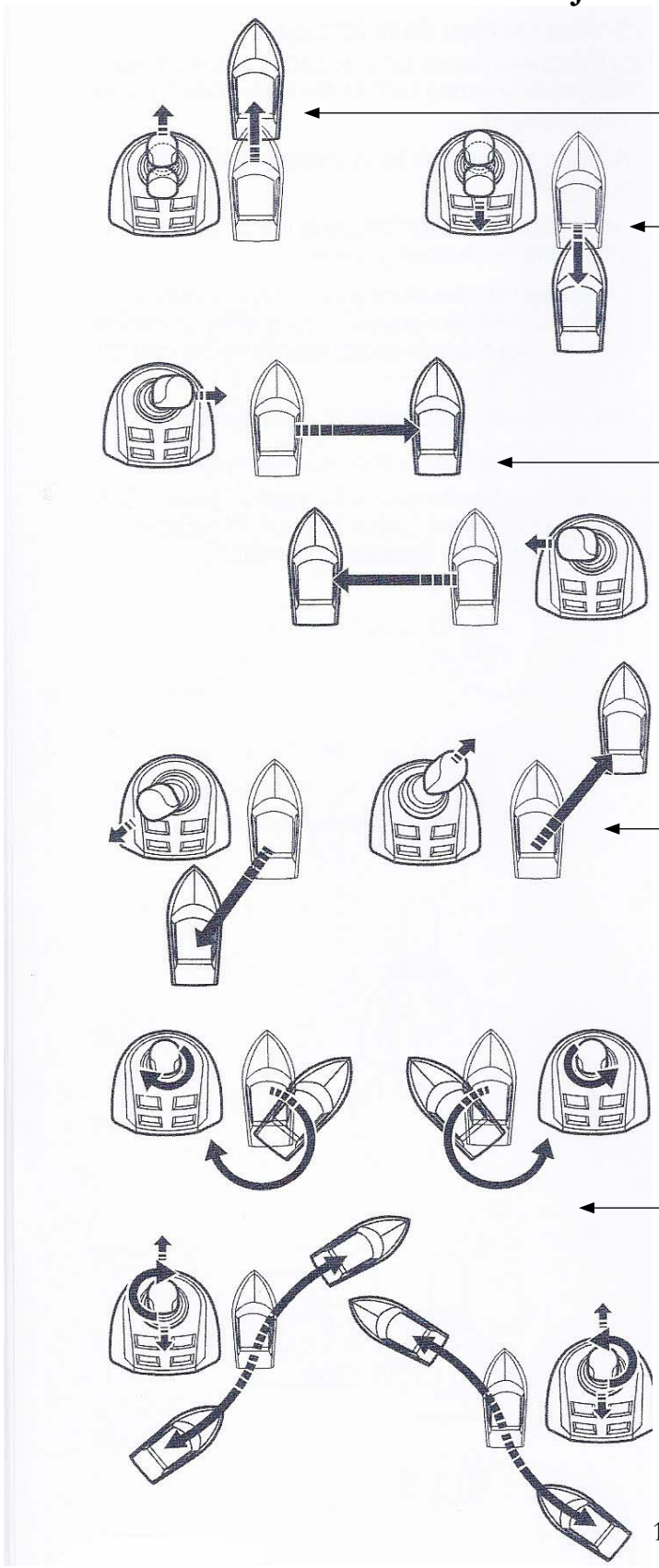
Below is a general description of the MerCruiser electronic control . Consult you engine operator's manual for more in-depth information or your closest Regal dealer.

Pressure on the joystick control determines the speed of the vessel. With the DTS remote control in neutral the joystick can be activated.

It functions with 360 degree control of the vessel maneuvering forward and aft, diagonally, or side to side. Be sure to read and understand the yellow tag above.

For more detailed functions read the engine operation manual.

TYPICAL JOYSTICK FUNCTIONS



Vessel Operation

This chapter explores select parts of running your vessel from casting off to docking and handling emergencies. We recommend further reading to enhance your information on the chapter topics. Also, become familiar with your engine owner's manual since many of the items noted here are found there in further detail.

GETTING UNDERWAY

Pre-Departure Questionnaire

- Have all fluid levels been topped off?
- Is the fuel tank full?
- Are the propellers in good condition?
- Is the drain plug in place (dry stored vessels)?
- Have all passengers been briefed on all emergency procedures and seated for departure? Is the boat load balanced?
- Is all safety equipment accounted for and easily accessible?
- Are navigation lights and sound signals in good working condition?
- Is the bilge free of water and do the bilge pumps operate?
- Is the operator sober, alert and ready to skipper the vessel?
- Have all passengers been fitted for the proper size life jackets?
- Has a float plan been filed and left with a competent person?
- Has the bilge been sniffed and the fuel system leak checked?
- Are the appropriate sea cocks open?
- Is all communication equipment in good operating condition?
- Has a second person been briefed on operational, emergency, and VHF procedures should the skipper become disabled?

■ Are all gauges and electrical switches functioning properly?

■ Has weather information been gathered and analyzed?

UNDERWAY QUESTIONNAIRE

■ After casting off have all dock lines and fenders been stowed?

■ Are all passengers seated?

■ As skipper are you monitoring the dash gauges and chart plotter for changes?

■ As skipper are you on the lookout for changing weather?

■ As skipper are you checking for abnormal vibration or steering?

DISEMBARKING QUESTIONNAIRE

■ Have you removed the keys from the ignition and secured them?

■ Have all systems been checked for leaks?

■ Have the battery switches been turned to the "off" position?

■ Are all storage compartments and seacocks closed?

■ Has the fuel tank been filled enough to assist in preventing condensation?

■ Is the vessel properly tied and covered with equipment stored?

⚠ WARNING

PRACTICE "NO SMOKING" AND EXTINGUISH ALL FLAMMABLE MATERIALS WITHIN 75 FEET OF ANY FUEL DOCK.

⚠ WARNING

PREVENT INJURY OR DEATH FROM FIRE CAUSED BY LEAKING DIESEL FUEL. INSPECT ENTIRE FUEL SYSTEM AT LEAST ONCE A YEAR.

⚠ WARNING

TO PREVENT INJURY OR DEATH USE ONLY GENUINE MARINE ENGINE/DRIVE REPLACEMENT PARTS

NOTICE

SINCE DIESEL IS AVAILABLE IN VARIOUS SEASONAL BLENDS, REFER TO THE ENGINE MANUFACTURER'S OPERATION MANUAL FOR ACCEPTABLE TYPES.

BEFORE FUELING

Note: To be extra safe the skipper should follow the procedures below for fueling gasoline. Gasoline contains highly flammable/explosive characteristics which need to be respected.

- Make sure a working fire extinguisher is at close hand.
- Stop engines while fueling.
- Disembark all passengers and crew not needed for fueling.
- Fuel if possible during the daylight hours.
- Check to ensure nobody is smoking in the boat or near the fueling dock.
- Close all enclosures to keep vapors from blowing aboard and settling in the bilge.
- Tie up your boat securely at the fuel dock.
- Identify the fuel fill.
- Visually inspect all fuel system components before each filling.

DURING FUELING

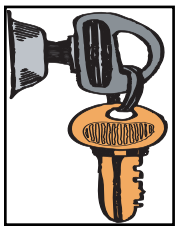
- Keep the fuel nozzle in contact with the fuel fill to guard against static sparks. The fuel fill pipe is grounded through the fuel system wiring to protect against static electricity.
- Avoid overfilling the fuel tank. Leave room for expansion.
- Avoid spilling any fuel. Clean up any fuel accidently spilled with a clean rag and dispose of it on shore.

AFTER FUELING

- Close all fuel fill openings tightly.
- Open all hatches.
- Sniff in the lower bilge and engine compartment for diesel fumes. If fumes are detected find the cause of the diesel odor until the odor is gone. Look for any traces of fuel droplets or spillage.

Do not start the engines, smoke or run any electrical components until the fumes can no longer be detected.

STARTING & STOPPING



The following general information covers starting and stopping your engines. Read and understand all previous information on remote controls, fueling and operational procedures. Pay particular attention to all labels. Refer to the engine operation manual for in-depth propulsion system information.

Review all pre-departure information. Before starting your engines make sure all canvas is removed and stored. Start engines only in a well ventilated location to avoid diesel exhaust buildup. Make sure all battery switches are activated. Close and lock the center windshield section.

⚠ WARNING

AVOID PERSONAL INJURY OR DEATH!
WHEN ENGINE IS RUNNING
TRANSOM DOOR MUST
BE CLOSED AND LOCKED.
SWIM PLATFORM
AND LADDER MUST NOT BE IN USE.

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH!
THE OPERATOR OF THE CRAFT
MUST HAVE COMPLETE CONTROL
OF THE HELM STEERING STATION
WHILE THE VESSEL IS MOVING.
NEVER LEAVE THE HELM
STEERING STATION UNATTENDED
WHILE THE VESSEL IS MOVING.

STARTING ENGINES

Position the remote control handles in the neutral position. Keep passengers seated and away from controls.

Note: With earlier models the Volvo EVC-D control station will be activated once the ignition key is in the "ON" position (key position l) At this point the neutral "**N**" icon will display a green light .

Next, turn the key to the start position (key position lll). You will hear the starter cranking over the engine. When the engine starts release the key switch. If additional cranking attempts are needed, the key must be returned to the **0** position first.

If the engine does not start, refrain from cranking the engine over 10-12 seconds. Allow the starter and battery a chance to recover. Advance the remote control in the neutral throttle position only as recommended in the engine manual. Do not race the remote control in the neutral position.

On later EVC-D systems, turn the key to the "ON" position and then to the start position. Release the key. The starter will continue to crank until the engine starts.

With this system once the keys are engaged in the automatic start position they are disengaged if you try to turn them again to the start position.

On the newest Volvo engines a key fob system is used to start the engines. The system uses two main parts; the key panel and the key fob. Two key fobs come with dual engine installation along with a 2.5" key panel. The key panel uses lighted icons to show active ignition and start/stop positions. Theft protection is vastly improved with the E-key system.

If the starter stays engaged for more than 30 seconds the circuit is automatically cut to protect the starter from overheating. If this happens, let the starter cool for several minutes before attempting to restart the engine.

Note: With all the above systems, refer to the Volvo operator's manual for further information.

SHIFTING-ALL ENGINES

Before shifting into reverse or forward make sure the coast is clear. When shifting to either gear from neutral make sure the throttle is in the idle position. Do not pause but engage the shifter quickly into the desired gear. Allow your vessel to lose all headway before shifting into reverse or forward gear. Practice shifting! You will become more familiar with the procedure and self-confidence will build especially in tight docking situations. Most importantly, stay alert!

STOPPING GUIDELINES

Before stopping the engines make sure they are in neutral and at idle speed. After an outing let the engines cool down by idling for a few minutes before turning the ignition off. Glance at the gauges one last time to monitor their readings. Never turn the engine off while in forward or reverse gear or back up in excessive speeds since water could enter the engine through the exhaust system and cause extensive damage. Above all, use common sense.

CAUTION

AVOID ENGINE DAMAGE!
CHECK THE OIL GAUGE IMMEDIATELY
AFTER STARTING ENGINE.
IF LOW OR NO READING
SHUT DOWN ENGINE IMMEDIATELY
AND INVESTIGATE THE PROBLEM.

CAUTION

TO PREVENT INJURY DUE TO FALLING
DO NOT OCCUPY SUNPADS WHILE
VESSEL IS MOVING!

FENDERS

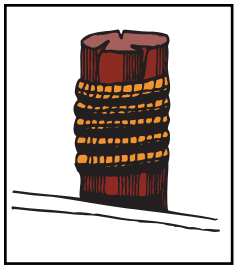
FENDER USAGE

Fenders are normally made of a rubberized plastic and are usually filled with air. Most have a fitting like a basketball so they can be inflated or deflated. Fenders are available in a wide range of sizes and shapes to fit both small and large vessels. Fenders are normally designated in inches. They are used for protection between piers, docks, sea walls and the vessel. They protect the topsides of the boat from rubbing against rough objects. Most fenders have attachment eyes which allow a line to be inserted vertically or horizontally. This will permit the fender to be tied off to fit individual dock and tidal situations. Be sure the fender is correct for the vessel size. The standard fenders specified for your Regal yacht are 10" in diameter and 26" long. It is a good idea to carry extra fenders but half a dozen is normally an acceptable number. Remember to store fenders on board so they can be easily accessed. The forward stairway locker stores 2 fenders. Sometimes people call fenders "bumpers" but this is not correct nautical terminology.

FENDER TYPES

Additional fenders can be ordered through your Regal dealer. Explain how you moor and use your vessel so your dealer can recommend the best fender type for you. We suggest the type with a fill plug so you can inflate them with a hand pump like the ones used for bicycles or a 12 volt compressor (plugged into the 12 volt vessel accessory plug).

DOCK LINE BASICS



Most skippers use dock line terminology fairly loose but there is more to the basics than just bow or stern lines. There are several lines that can be secured to the bow and stern and depending on their direction and use, can be called other names. Remember that "forward" and "aft" refer to the direction that a spring line runs from the vessel, and not where it is secured on board.

BOW AND STERN LINES

There is only one true bow line. It is secured to the forward cleat and run forward along the dock to prevent the vessel from moving to the stern. The stern line leads from a rear cleat to a piling or cleat on the dock astern of the vessel. This line keeps the boat from moving ahead. For small vessels these are the only lines needed for normal wind and current conditions. If located in a tidal environment, keep slack in the lines.

BREAST LINES

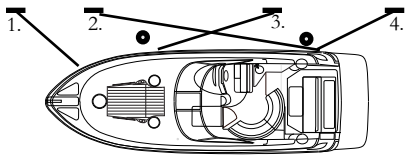
These lines are attached to the bow and stern that lead to nearly right angles from the center of the vessel to the dock. They help keep larger vessels from moving away from the dock, or are pulled in to help people board the vessel. Bigger vessels may use bow or quarter breast lines.

SPRING LINES

Most boats use two spring lines although it is possible to have four. They are called the after bow spring and forward quarter spring.

Bow springs are secured at the vessel's bow area. Forward spring lines lead forward from the boat to the dock and control movement stern ward. After springs stem aft from the vessel, and stop movement ahead. Spring lines are used to prevent movement in a berth, ahead or astern. They are really useful in controlling the effects of a real active tidal surge. Spring lines are useful where fenders need to be kept in place against piles.

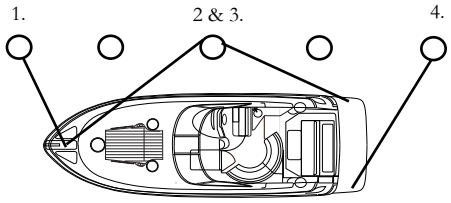
TYPICAL PIER MOORING



1. Bow line
2. After bow spring
3. Forward quarter spring
4. Stern line

=FENDER

TYPICAL PILING MOORING



1. Bow line
2. After bow spring
3. Forward quarter spring
4. Stern line

BOAT MOORING

Most boats can be secured to a dock using four lines. The after bow spring is crossed with the forward quarter spring and secured to individual dock cleats or pilings. This ensures longer springs and can be snugged up tighter for more efficient tidal control. Remember, if you only have one piling available, position the vessel so this point is opposite amidships. Run both spring lines to it. These lines will be shorter but still useful.

The bow and stern lines should be relatively at a 45 degree angle with the dock. The stern line can be attached to the near-shore quarter cleat, but will work more efficiently to the offshore quarter cleat. The longer line will allow the boat flow with the tide with less time checking the vessel.

DOCK LINE SIZING

Most dock lines today are made of nylon, either of twisted rope or braided core and cover. The most often used material is nylon because of its stretching abilities absorbing shock loads. It is chafe resistant for extended life and is easier on bare hands.

The line's size varies with the vessel. Normally, a vessel in the 50' range will use 5/8" diameter nylon lines.

Dock lines need to have the strength to hold the vessel and have enough density to resist chafing. They shouldn't be too heavy that they lose their shock-absorbing capabilities. Use the right size line for the vessel since a line too large for the boat will pull hard against the vessel since it won't be forced to stretch. If the line is too small for the vessel, there is no margin for wear and chafe when under strain.

SECURING LINES

When mooring your boat, make sure the dock lines are secured at both ends. Depending on your situation you may need to loop the eye splice of the dock line around a piling. Sometimes the mooring line will lead down sharply from the piling to the deck cleat. Loop the eye splice around the piling twice to keep it from being pulled up off the pile. Pull the line through the looped eye if the mooring line is too small to go around the piling twice or too small to fit over once.

If you must drop a line over a piling that already holds another boat's line, run the eye of the line up through the first eye from below, then loop it over the pile. This will allow either line to be removed without disturbing the other. If another line is dropped over yours, simply reverse the process.

Secure a little slack in the other dock line, then slip your eye up through its loop and over the top of the pile. Your line can be dropped through the other eye.

Note: Never use the swim platform cleats for permanent mooring cleats.

DISEMBARKING-LEAVING THE DOCK

When debarking from a dock, it is easier to release the line from a cleat or piling, from on board the boat, as soon as you leave the dock. Loop a long line around the cleat or pier and leading both ends on board you can release the line easily. Slip one end around the cleat or pile, the pull it back on board. Release the line without the eye splice, so it will run freely from around the pile without hanging up on the splice.

DOCKING-KNOTS

Knots are useful in docking, towing and other emergency situations. Learning to tie knots requires practice. As they say " Practice makes perfect". Some of the knots used in boating are the square, bowline, anchor bend, clove hitch, figure eight and half hitch. There are several periodicals available that explain various knots and how to tie them effectively. An experienced skipper will know the basic nautical knots and will use them when on the water. Take the time to know the basic knots.

Figure 8 Knot Tied To Cleat

A useful knot to learn for general docking is the figure eight with one end reversed. By turning the free end of the line back under, the knot can be released without disturbing the boat. After some practice one person can secure a vessel easily to a dock or pier in a variety of weather conditions. This knot normally is used to tie the bow and stern. Then the vessel can further be fastened by tying the spring lines in the figure eight knot. Wrap it around the cleat 2 or 3 times.

DOCKING-GENERAL

As a general note docking and slow speed maneuvering can be one of those operations many skippers dread. Use common sense when docking. Be aware of the boat speed, controls, wind and have a feel for the water current especially in tidal areas. Keep calm and have your crew ready to cast lines and install necessary fenders.
Docking without joystick technology takes abit more practice and focus but can be mastered and made to look easy with a seasoned skipper and crew.

With the Volvo or Axius joysick option and a little practice will make you look like a pro while docking your vessel in wind, current, and tight mooring situations.
Read your engine manual to become familiar with the joystick and remote control components. It is a good idea to practice your beginning docking techniques in an open area. Remember practice makes perfect!

Helpful hints using joysticks;

1. For better control hold the joystick knob lightly almost like you would a delicate object. Push the joystick to the port or starboard, forward or aft and the rig instaneously follows the fine finger movements on the joystick knob. Twist the knob and the boat spins on its own axis.

2. Remember that both engines need to be in neutral before activating the joystick buttons or it will not work.

3.The joystick brain responds to the turns not the position of the wheel. So whatever position you have the wheel facing when you disengage the stern drive joystick that is your new straight ahead position. Most seasoned skippers would position the wheel straight before disengaging the system.

4. You do not have to worry about disengaging the joystick and shifting the control into the drive mode at too high an rpm as the system prevents any shifting above predetermined limits.

ANCHORING

Your vessel features a Danforth type anchor. The anchor will set quickly in a variety of bottoms because of its unique shank profile and ballasted tip. It is a high holding type anchor made from products for maximum tensile strength..

The anchoring process is easier with another person on board. First be certain that the line for the anchor is properly attached, to avoid losing the anchor and anchor line overboard.

Chain will stand up to the abrasion of sand, rock, or mud on the bottom much better than a nylon line. Being galvanized the chain will resist corrosion. 3 strand nylon line has been added to ensure a adequate scope in different depths and weather situations. The nylon will stretch under a heavy strain cushioning the impact of waves or wind on both the boat and the anchor.

To anchor, select an area preferably with a flat bottom. Mud, sandy clay and firm stand afford the best bottoms for anchoring. Grassy bottoms often resist the anchor taking hold and end up pulling out grass and roots. Contrary to modern belief, you do not anchor while the boat is making headway, or moving forward. In fact, the bow of the boat should be brought slowly backward, while releasing the anchor until it hits the bottom. To "snub the line" means to stop its outward "pay" or movement.

Usually the length of anchor line used should be 5 to 10 times the depth of the water depending on weather conditions. This ratio is called the "scope"; the minimum scope under average conditions is 7 or 8:1. If the scope is too short the anchor's efficiency is diminished. A longer scope cushions the shock load on the entire system.

Once a scope is determined sometimes it is difficult to know how much line to let out to reach the desired scope especially at night. One way to mark an anchor line that will identify the amount of line is to paint wide and narrow bands from about 50' to 150' in 10' intervals. The wide bands equal 50' and each narrow band would equal 10'. Distinguish each 50' band with a different color paint. This can be done with "see in the dark" paint. Simply tape each length for the appropriate band before painting it.

After you have anchored, check your position with landmarks if possible. You need to continue to monitor these landmarks to make sure you are not drifting. Since anchoring can also be an emergency procedure, the anchor and line should be readily accessible. Check anchor locker to ensure an untangled anchor line.

Once anchored the anchor line must be secured to a strong tie such as a cleat.

Do not rely on the windlass brake to carry the anchor rode load.

Use a series of full turns and half-hitches around the cleat horn to prevent any line slippage or jamming. This is important as the scope may need to be adjusted over a period of time and you need swift access to the line.

For increased holding power in windy conditions, two anchors are sometimes set. If your primary anchor drags, you can run out your secondary anchor without picking up the primary one. The important thing is to lay them out at an angle. When setting two anchors, make sure they are fastened to separate strong ties such as cleats. This is done in case you need to adjust one later so the line must be accessible.

Note: In times of high waves a buoy on the rode works as a shock absorber and allows the vessel's bow to ride the wave crests without large strains being transmitted to the set anchor. These plastic foam buoys can be purchased at boating retail outlets.

TOWING

In case you find yourself aground or in need of a tow, or should you want to tow another vessel, keep in mind that you **never use deck hardware or cleats to secure lines for towing!**

Deck hardware is intended for mooring and anchoring, and is not designed to withstand the strain and pull of towing. Rather than tie the line to your cleats on deck, it is suggested that you tie a bridle by passing a line completely around the hull of your boat to avoid structural damage.

When towing, always stand clear of a taut line, as any type of line breaking under stress can be extremely dangerous. The preferred line for towing is double-braided nylon, as it has sufficient elasticity to cushion shock loads. Move slowly and cautiously.

DANGER

AVOID DEATH OR SERIOUS BODILY INJURY!
DO NOT USE DECK HARDWARE
INCLUDING CLEATS FOR TOWING
OR LIFTING PURPOSES.

ADMIRALTY LAW

The Admiralty law sometimes referred to as the salvage law was founded primarily on English law fundamentals and basically says that a vessel distressed, in danger of flounder, if rendered assistance from a towing company or private agency, can be forced to relinquish a portion of the vessels' worth for the assistance received.

NOTICE

IN THE EVENT YOUR VESSEL
IS IN DISTRESS
PRIOR TO ALLOWING
ANY TOWING COMPANY
OR PRIVATE AGENCY THE RIGHT
TO PASS A LINE TO YOUR VESSEL,
BE SURE TO ESTABLISH THAT YOU
DO NOT AGREE TO ANY SALVAGE RIGHTS.
ESTABLISH WITH THE CAPTAIN
OR OPERATOR
THAT YOU WISH TO BE ASSISTED
IN A CONTRACT BASIS
AND ESTABLISH A PRICE.
OF COURSE IN CERTAIN SITUATIONS,
YOU MAY NOT HAVE THIS OPTION.
USE YOUR BEST JUDGEMENT!

EMERGENCIES

Always be ready to help others on the water if possible, but do not take any unnecessary risks. Use equipment to save a life, but do not risk a life to save equipment. Consult earlier information in this manual concerning accidents, etc. Also, read other literature concerning on the water emergencies. Be alert and prepared!

FIRE

Fire aboard a vessel can spread quickly and can cause tremendous alarm among everyone. Most fires can be prevented by keeping the bilge free from oil and debris. Keep all equipment stowed and maintained in working order. Carry backup fire extinguishers on board. If something becomes a possible fire hazard, remove that possibility at once.
Never use water on gasoline, oil or electrical fires. When you dump water on an electrical fire you can be shocked since water conducts electricity.
Follow these instructions if a fire breaks out:

1. Fit everyone aboard with a life jacket. Turn off the ignition switch.

2. Try to keep the fire downwind. If the fire is to the stern, head the bow toward the wind. If forward, put the stern to the wind.

3. If the engine should catch fire, shut off the fuel supply Usually there is a fuel tank access that you can crimp the fuel feed line.

4. Use a hand fire extinguisher. Make sure to point it at the base of the flames. Use short bursts and sweep the extinguisher side to side. **Remember: (A 4 pound extinguisher discharges in approximately 20 seconds)**
These actions help prevent the fire from spreading to other parts of the boat. You can extinguish fires quickly if you act swiftly. Have a plan of action in motion in case a fire breaks out.

FIRST AID

Knowing first aid can save lives. A first aid kit and the ability to use it are important ingredients for the safety of a skippers' passengers, crew and vessel. Having confidence and competence in handling medical emergencies on board is a must for the skipper. Invest your time in a first aid course available at the American Red Cross.

CPR (BASIC LIFE SUPPORT)

If someone is seriously injured have someone call for help while the injured person is being attended.
Check for possible danger signs; loss of breathing, unconsciousness, severe bleeding and heartbeat. If you determine the individual is not breathing or unconscious place the victim on their back on a hard surface and do the following:

1. If unconscious, open the airway. Neck lift, head lift or chin head lift.

2. If not breathing, begin artificial breathing. Pinch the nose. Give 4 quick breaths. If airway is blocked, try back blows, abdominal or chest thrusts and finger probe until airway is open.

3. Check for pulse. Begin artificial circulation. Depress sternum. Fifteen compressions rate 80 per minute. 2 quick breaths. Continue uninterrupted until advanced medical support is available.

HYPOTHERMIA

Hypothermia is a condition where the body temperature decreases because the body can't generate enough heat to maintain its normal temperature. It can be serious and usually occurs where victims have been immersed in water (under 68 degrees) for periods of time. If you encounter a possible hypothermia victim call for help on the radio and get the person out of the water.
Symptoms are:

1. Shivering that if condition is advanced may stop.

2. Confusion, clumsiness or slurred speech.

3. Rigid muscles.

4. Semiconscious to unconscious.

Treat hypothermia by the following:

- Remove wet clothing.

- Monitor the victim's pulse and breathing.

- Rapidly apply heat to the body core by using blankets, naked bodies or warm water.

- Do not give the person any food or drink.

- Do not warm the arms and legs. Warming of these extremities can be fatal.

Follow up immediately with medical authorities!

CALIFORNIA AIR RESOURCE BOARD (CARB) LABEL

Your Regal boat may have a star shaped label affixed to the bow port hullside. It is located at the front of the state registration numbers. This label is part of the California Air Resource Board (Carb) SD/I rule. If your boat is operated in the state of California and/or bordering waters, this label MUST remain intact. The label shows that the engine installed as original equipment meets a currently approved California state regulatory emission level. See the example below which shows the current California ultra low 3 star label.

CARB LABEL

CALIFORNIA PROP 65

Proposition 65 relates to the state of California and is an additional requirement added to their Safe Drinking & Toxic Enforcement Act of 1986. Prop 65 basically summarized states that: "No person in the course of doing business shall knowingly discharge or release a chemical known to the state to cause cancer or reproductive toxicity into water or onto land where such chemical passes or probably will pass into any source of drinking water ...." and it goes on to say " no person in the course of doing business shall knowingly and intentionally expose any individual to a chemical known to the state to cause cancer or reproductive toxicity without first giving clear and reasonable warning to such individual ....."
For more information, contact the California Office of Environmental Health Hazard Assessment at 916-445-6900 or http://www.oehha.ca.gov/prop65.html.

⚠ WARNING

A wide variety of components used on this vessel contain or emit chemicals known to the State of California to cause cancer and birth defects and other reproductive harm.

EXAMPLES INCLUDE:
* Engine and generator exhaust
* Engine and generator fuel, and other liquids such as coolants and oil, especially used motor oil
* Cooking fuels
*Cleaners, paints, substances used for vessel repair
* Waste materials that result from wear of vessel components
* Lead from battery terminals and from other sources such as ballast or fishing sinkers

TO AVOID HARM:
* Keep away from engine, generator, and cooking fuel exhaust fumes
* Wash areas thoroughly with soap & water after handling the substances above

FUEL SPILLAGE

The federal water pollution control act prohibits the discharge of oil or oil waste (such as from the sump bilge pump) into or upon the navigable waters of the United States or the waters of the contiguous zone. Violators are subject to substantial civil fines and criminal sanctions.
A placard is normally found inside the engine hatch area or in the sump warning of overboard discharge of oil or oily waste.

ENVIRONMENTAL AWARENESS

There are numerous vessels operating on our waterways on a daily basis. Each boat has as impact on our environment. Boat operation habits, marine sanitation, and maintenance all play a role in a delicate battle to keep the ecosystem clean. Each of us has a role in doing our part as a environmentally conscious skipper to conserve our waterways.
The National Marine Manufacturer's Asscociation lists their top ten of Eco-Boating Practices as follows:

1. Observe all regulatory agency policies regarding marine toilets.
2. If equipped with a holding tank, use marina pump-out facilities.
3. If used, make sure bottom paints are legal and ecosystem friendly.
4. Use only biodegradable cleaning agents.
5. Dispose of all garbage and liter on shore properly, not on the water.
6. Don't top off fuel tanks. Leave expansion room. Clean up spills.
7. Watch your wake and propeller wash.
8. Make sure your engines are well tuned and maintained.
9. Control your bilge water.
10. When fishing, practice the "catch and release" principle.

Auxiliary Equipment Operation

AUXILIARY COMPONENTS

OVERVIEW

In addition to the main components and systems reviewed in Chapter 4 there are auxiliary equipment components outlined here. To locate more detailed information for the auxiliary components refer to the appropriate manufacturers owner's manual found in the owner's information packet. Also, further updated information may be available on the internet by using the proper name of the component and the Goggle® search vehicle.

Note: Equipment or vendors may change during a boat's life cycle as we are constantly upgrading our product line. Regal Marine Industries, Inc. retains the right to change vendors, equipment, specifications, component location, and other technical data at any time.

QUICK REFERENCE GUIDE TO AUXILIARY EQUIPMENT

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INTERIOR EQUIPMENT

CARBON MONOXIDE DETECTORS

Carbon monoxide known as CO is indeed the silent killer. It is a by-product of combustion. CO is invisible, tasteless, odorless and is produced by all internal combustion engines, heating and cooking appliances.
The most common forms of CO on board vessels are petrol engines/generators and if applicable, propane heating and cooking devices. *Note: Even though your vessels propulsion system is diesel based follow the CO precautions. Also, remember that a vessel moored next to you may be a CO poison contributor.*
Never operate these devices when people are sleeping. A slight amount of CO in the human body over several hours causes headaches, nausea and symptoms close to food poisoning, motion sickness or flu. High concentrations can be fatal within minutes.

HOW THE SYSTEM WORKS

The CO detector uses a mini computer to measure and accumulate CO levels. Using the principle of "time weighted averaging" the detector monitors CO concentrations, temperature, humidity and time to calculate COHb levels. To explain COHb, our bodies prefer to absorb CO to oxygen and COHb is the absorbed ratio stated in a percent.
If the detector senses high levels of CO the alarm will sound in a few minutes. If lower levels are sensed, the detector will accumulate the data and sound an alarm when the appropriate level is reached. *Read and understand the CO owner's manual in the information pouch.*

To turn the CO detector system on:

1. Notice the CO breaker on the 12 volt main DC panel. It must be turned off in a two-step sequence. This is for safety purposes. The system should be always left ON. You must flip back the switch cover before you are able to deactivate the breaker.
The CO circuitry works to its best performance when continually activated plus it accords advanced warning when entering an area high in CO.

2. When power is applied to the detector, the power indicator (top) will flash on and off, followed by the (red) lower alarm indicator flashing off and on as part of a 8-14 minute warm-up period. The green (top) power indicator will indicate a solid green when the unit has reached correct operating temperature. Never operate a cooking device with the canvas up or the cabin door completely closed to prevent CO concentration build-up

CO DETECTOR

3. The test cycle should be activated frequently. Simply press the button. When it is released, the (top) power indicator will flash off and the lower indicator light will flash on. Then, the lower indicator will flash off and the upper indicator light will come back on.
The top indicator light being on solid green indicates *normal* operation. Refer to the CO detectors owner's manual for an explanation of the test cycle indicators.

4. When an alarm sounds take action immediately. The danger alarm indicator flashes red and the horn beeps 4 times, pauses and repeats the cycle. This indicates a rate of 10% COHb has been reached.

a. Operate reset/silence button.
b. Call your emergency services (911)
c. Immediately move to fresh air. Do not re-enter the vessel. until emergency personnel have arrived, aired the vessel out and the alarm is in a normal condition.
d. After following steps a-c and your alarm reactivates within a 24-hour period call a qualified technician to inspect the vessel. Note that the CO detector will clear when the CO concentration has dropped below 70 ppm.

TYPICAL DOOR-COMPANIONWAY

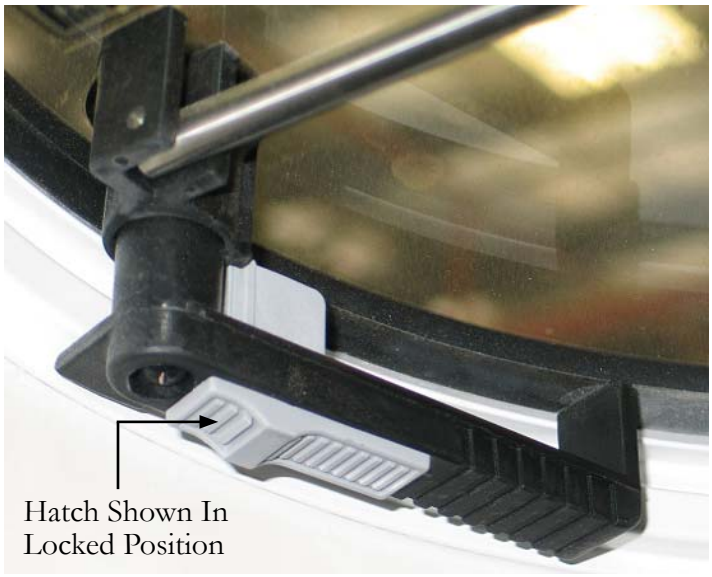
Keep the cabin door secured closed when the boat is moving. When at mooring, the cabin entry door can be held open by sliding the door and securing it open with the door stop. This will prohibit the door from accidentally closing, a great safety feature. The built-in screen door functions independently on its own track.

With the screen door closed and the hatch screens in place cross ventilation can be achieved along with the ability to keep insects out of the cabin.
Periodically, remove any accumulated door track debris and lubricate the tracks to keep the doors sliding freely.

GREY WATER SYSTEM

If installed, the grey water system equipment collects all used water exiting from the shower sump pumps along with the galley and head sinks. The used water is stored in the ship's holding (waste) tank. This option is used in various locals where it is illegal to pump "grey" shower and sink water overboard. The automatic float switch pumps grey water to the holding tank.
Normally it would not require any special service unless there was blockage somewhere in the system or a hose leak developed in the system. Since more liquid in the form of grey water is being returned to the holding tank pay closer attention to the waste monitor panel. The holding (waste) tank may need to be pumped out more frequently.

HATCHES

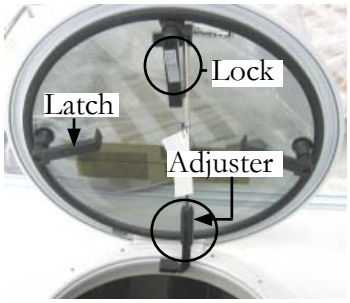


Most deck hatches feature a locked position. To lock the hatch first grab the handle and turn it so it engages the side of the seal ring as shown. Push the lock mechanism to engage the handle in the locked position.

To unlock the hatch pull the handle away from the seal ring (in line with adjuster) or 90 degrees from the locked position.

To open the hatch make sure the hatch is unlocked. Then push the rod up and lock at desired angle by turning the adjuster.

A flexible screen is provided for cross ventilation and to protect against insects. Blackout shades are featured on the deck hatches for privacy. Simply fit the round blackout shade against the inside hatch glass and turn the latches as needed to hold in place. See the illustration below.



LIGHTING-GENERAL

Your vessel features various styles of lighting such as overhead, hanging locker, reading and florescent types. Each lighting fixture requires specific bulb types and replacement procedures. Read and understand the following warning.

⚠ WARNING

AVOID SERIOUS INJURY!
EARLIER HALOGEN & XENON LIGHT BULBS DEVELOP EXTREMELY HOT TEMPERATURES.
NEVER REMOVE A HOT LIGHT BULB SINCE IT COULD CAUSE SKIN BURNS.
WAIT FOR THE BULB TO COOL BEFORE ATTEMPTING TO REMOVE IT.

Note: The bulbs listed in the following pages can be ordered through a Regal dealer or may be available at speciality lighting or box stores. When changing the earlier halogen light bulbs never touch the bulb surface with your fingers as premature burn out can occur due to oil on the skin touching the bulb surface. Handle bulbs only from the ends.

To change the earlier halogen overhead light bulb follow these steps:

Using a sharp object such as a small slotted screwdriver, slide it between the lens cover and the light base.

Pull down on the lens cover to access the bulb.

Remove the defective bulb.

Replace the bulb with a 12 volt, #10WXM halogen type.

Line up the space in the lens cover/body with the notched area of the light base.

Push the prongs on the lens cover/body upward until they seat into the light base.

Later overhead lights use LED technology which is known for clear visibility, long service life, and energy savings. Note: *These later LED lights will feel much cooler than the previous halogen type.*

HANGING LOCKER LIGHTS

Lens Cover Removed

To change a hanging locker light bulb follow these steps:

- Remove the lens cover from the lamp base. There is a tab on the bottom of the lens cover. Push the lens cover at this point to remove it.
- Remove the defective bulb.
- Replace the bulb with a 12 volt halogen bulb type # 563.
- Reinstall the lens cover by snapping it in place.

READING LIGHTS

To change a reading lamp bulb follow these steps:

Reading lights use a marine type bulb that allows for rough service. To change the bulb turn the fixture and grasp the old bulb and pull it straight out. Replace with the same wattage bulb. Reinstall the bulb in the lamp socket using a tissue to hold it. This procedure will help extend the bulb service life.

FLORESCENT LIGHTS

To change the florescent light bulb follow these steps:

■ Remove the lens cover from the lamp base by grasping the lens on the far side. With both hands pull up on the lens to detach it.

■ Turn the bulb until both tabs on the bulb line up vertically. Pull down on the bulb to release it from the lamp body at both ends.

■ Replace the bulb with a Thin Lite Cool White # F8T5-CW -HG.

MONITOR-WATER/WASTE

To read either the fresh water or waste water monitor panel the breaker on the main DC panel must be activated.

The monitor is normally located inside the ship's AC/DC cabinet

The fresh water monitor displays the amount of potable water in the system. There are sensors located in the water tank that send a signal to the display panel when activated. Press the top portion of the toggle switch and read the gauge display.

The waste portion of the display shows the amount of waste water in the holding tank. There are sensors located in the waste tank that send a signal to the display panel when activated. Press the bottom portion of the toggle switch and read the gauge display.

This portion of the system needs to be monitored periodically to prevent the system from being over full which could cause equipment damage and/or a possible leak in the vessel.

If the waste system is determined to be full it can be emptied by connecting a marina pump-out hose to the waste fitting located on the deck. The pump out device will actually remove the waste much like a vacuum cleaner. This is the easiest way to eliminate the vessel's waste and be environmentally friendly while performing the task.

An alternative method *which can be used in International waters only* is to pump the waste overboard using the waste seacock.

With overboard discharge pump options a key switch is provided to pump waste overboard through the appropriate through the seacock located in the hull bottom. The seacock handle is tie wrapped shut to conform to domestic waste laws.

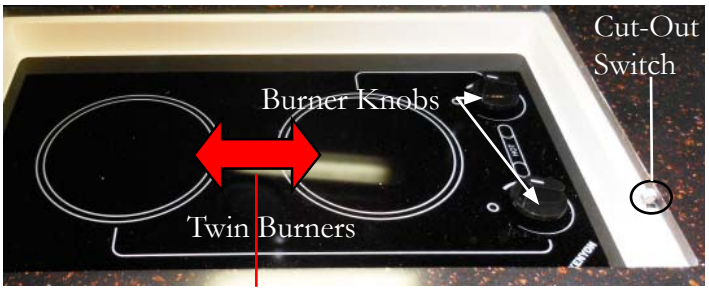
Make sure the waste seacock is open and you are legal to pump overboard. Turn the macerator breaker on and then energize the monitor panel key switch.

Be sure to turn the seacock handle to the "off" position and secure it with a tie wrap after the pump-out cycle is completed You can be fined if authorities find the seacock in an unlocked position.

PORTLIGHTS

Portlights provide cabin cross ventilation in addition to light. To open, turn the latches port or starboard until the portlight cover clears. Lift the black handle to control the amount of fresh air. To close, shut the portlight cover and turn the latches up to provide a seal. A screen is provided for insect protection.

RANGE/STOVE



RANGE TOP CUT-OUT SWITCH

This glass top range (stove) operates like most home units. It features twin burners and cover coordinated to the counter top solid surface material.

A cut-out switch shuts the power to the stove burners should a cooking fire develop. When the cover is installed over the stove the burner power is then interrupted. At that point the stove breaker on the main AC panel should be turned to the "off" position.

Always have the correct type portable fire extinguisher ready when cooking aboard the vessel.

WARNING

AVOID SERIOUS INJURY!
NEVER ALLOW SMALL CHILDREN
NEAR THE COOK TOP!

WARNING

AVOID SERIOUS INJURY!
OBSERVE ALL SAFETY INSTRUCTIONS
WHILE USING THE COOK TOP.

TYPICAL REFRIGERATOR

OVERVIEW

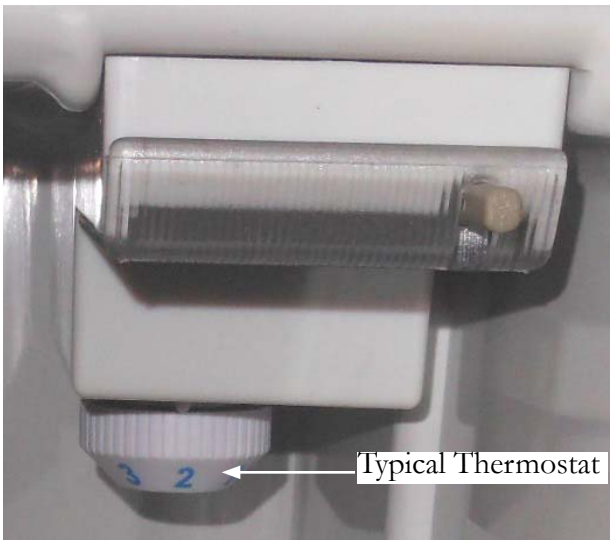
Your refrigerator is designed to operate in the tough marine environment. It can withstand a heel angle up to 30 degrees for a short time which makes it very adaptable for marine use. A few tips regarding the refrigerator:

Select refrigerators and icemakers open by simply pushing the latch down and then pulling the door open. When you close the door the handle automatically will assume the closed position.

1. The refrigerator uses AC/DC current switching automatically as needed. Turn on the breaker at the ship's AC/DC service panel before activating the refrigerator.
2. Unnecessary opening of the refrigerator door will increase power consumption.
3. Keep the inside of the unit clean and dry.
4. Remove any water that may collect on the shelf under the freezer compartment.
5. When leaving the vessel for extended periods of time turn the breaker off at the ship's service panel. Remove any food from the unit. Prop the door open slightly before leaving the vessel. This helps air out the refrigerator.
6. Note: The unit will keep food cold 5-6 hours without any DC power providing the food is chilled already.
7. It is important that the refrigerator compressor/condenser be well ventilated so cooler air can enter from the bottom and warm air can exit the top of the unit. Never block any of the ventilation grilles.

TEMPERATURE SETTING

Your refrigerator is equipped with a manually controlled infinitely-variable thermostat.
Turn the thermostat clockwise to lower the temperature and counterclockwise to raise the temperature and to activate the on-off switch. A slight spring resistance is noticeable at the on-off switch.



DEFROSTING

The refrigerator requires defrosting when the frost layer is around 1/8".
To defrost do the following:

1. Turn the thermostat off.

2. Store the food and beverages from the refrigerator in an iced down cooler.

3. Do not use sharp metal objects to remove the accumulated ice. Let the refrigerator deice under normal cabin temperatures.

4. Restart the refrigerator after it is completely defrosted. Be sure to clean and dry the unit.

5. Empty the drip tray below the freezer compartment as often as needed in the defrosting cycle.

Normal Refrigerator Operating Sounds

Your refrigerator/icemaker combo features rigid foam insulated cabinets to provide high thermal efficiency and maximum sound reduction for its internal working components. In spite of this, the unit still may make some unfamiliar sounds.
Normal operating sounds may be more noticeable because of the unit's environment. Hard surfaces such as fiberglass floors have a tendency to reflect normal appliance operating noises.
Common refrigeration components, and a brief description of the normal operating sounds they make, are listed below.
Note: Your unit may not contain all of the components listed.

Compressor- The compressor makes a humming or pulsing sound during normal operation.

Evaporator- Refrigerant flowing through this unit may sound like boiling water.

Condenser Fan- May hear air moving through it.

Water Valve- At each cycle, a buzzing is heard.

During periods of non-use do the following:

1. Turn off the icemaker breaker at the ship's AC distribution panel.

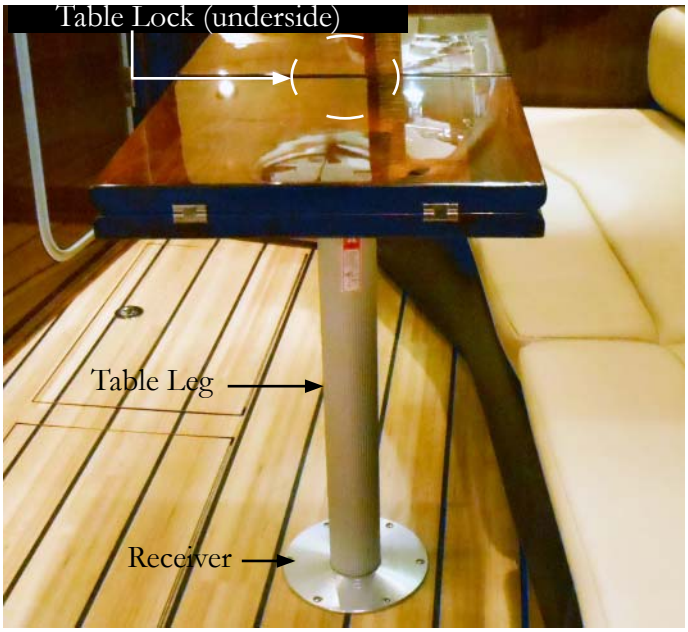
2. Turn the unit off at the power valve.

3. Raise the bin arm to turn the icemaker off.

4. Empty the refrigerator of all items. Clean the interior of the unit with a mild non-abrasive detergent and warm water solution applied with a soft sponge or soft cloth. Rinse with warm water and a soft sponge. For rust spots use Bon-Ami®or Barkeepers Friend Cleanser®

5. Prop the door open. The unit will manually defrost.

SALON TABLE- TYPICAL



SALON-DINETTE TABLE ADJUSTMENTS

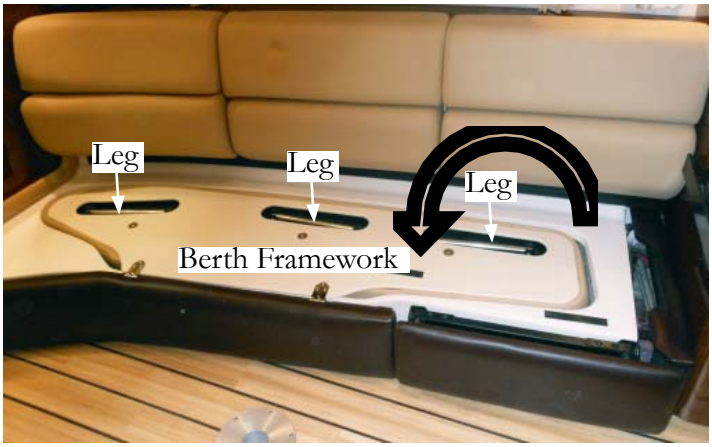
The salon-dinette table is designed to be moved as needed to provide dining and lounging capabilities. To set up the table:

1. Set the table on the sofa with the table pedestal lock facing up. Turn the table leg lock counterclockwise until the gap is large enough to accommodate the table leg diameter. Insert the table leg and titghten lock until secure.

5. Insert the table and table leg as an assembly snugly into the floor receiver.

SALON SOFA- CONVERSION TO BERTH

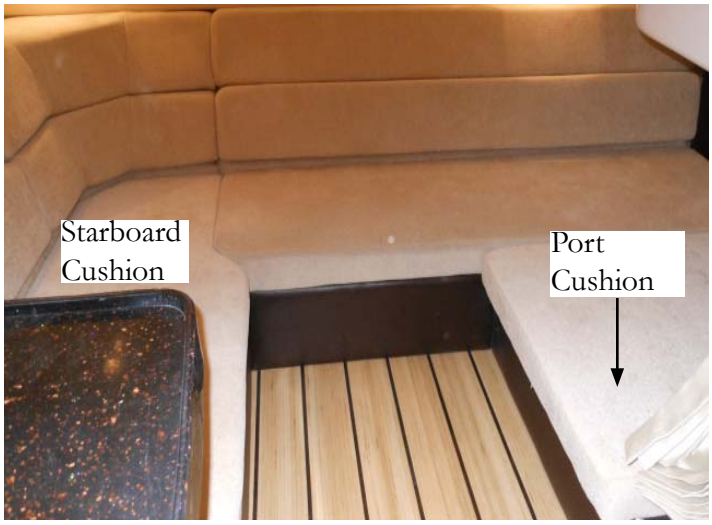
To convert the salon sofa to a berth remove both cushions and put them aside. This will expose the berth framework.

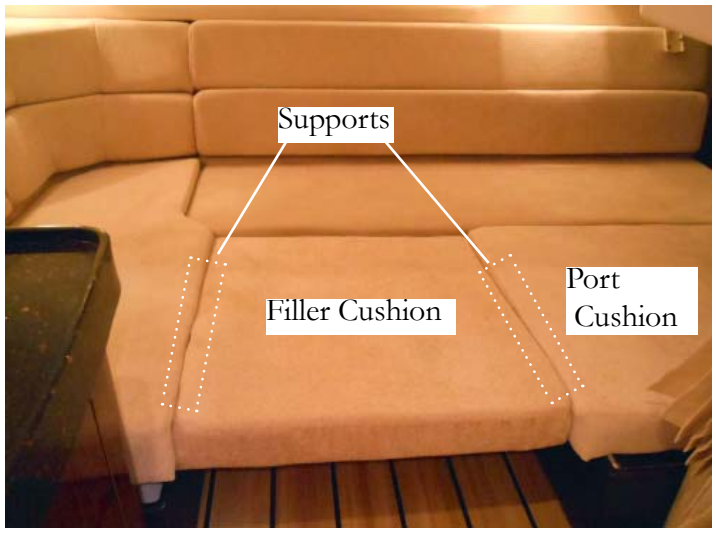


Find the legs and position them straight up. Grasp the back of the berth framework at the leg cutout area and pull forward until the entire framework rests on the floor with legs even. Check to make sure all legs are completely locked in the down position.

Lay the berth elongated cushion on the berth framework. Install the 2 remaining cushions to complete the berth set-up.

MID CABIN- CONVERSION TO BERTH





This illustration shows the normal mid berth seaating positions. To convert the seating to a berth do the following:

1. Lift the port cushion shown. It uses a gas assisted ram. Under the port cushion is a filler cushion.

2. Remove the filler cushion.

3. Set the filler cushion on the supports located on the starboard and port bunk framework.

4. Slide the cushion in place to complete the berth set-up.

SEATING-HELM TYPICAL

The helm seat features an electric hydraulic mechanism which moves the captiain's seat up-down to accommodate different body types and cruising options. The helm switch for up and down adjustment is found at the starboard switch panel.

The helm seat features a leaning post to gain extra height or additional standing room at the helm when maneuvering in close quarters. See the illustrations.

SEAT-HELM-EXTENDED HEIGHT

TV (LCD) MONITOR PRECAUTIONS

The following safety information applies to all LCD flat screen television monitors. Refer to the antenna switch information in Chapter 4.

TYPICAL SALON LED TELEVISION

SAFETY INSTRUCTIONS

CAUTION

RISK OF EQUIPMENT DAMAGE!
IN FREEZING CLIMATES
REMOVE THE TELEVISION SET
FROM THE VESSEL.

CAUTION

RISK OF ELECTRICAL SHOCK!
DO NOT REMOVE COVER
AT TELEVISION REAR.
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING
TO QUALIFIED PERSONNEL ONLY.

NOTICE

THE FLUORESCENT LAMP USED IN
THIS TELEVISION CONTAINS A SMALL
AMOUNT OF MERCURY.
DISPOSE OF THIS PRODUCT
IN AN ENVIRONMENTAL FRIENDLY
MANNER USING LOCAL GUIDELINES.

NOTICE

IF TV FEELS COLD TO THE TOUCH
THERE MAY BE A SMALL FLICKER
WHEN IT IS ACTIVATED.
THIS IS NORMAL.

NOTICE

WHEN LEFT FOR EXTENDED PERIODS
TURN THE TELEVISION BREAKER
TO THE OFF POSITION
TO HELP PREVENT
POWER SURGES OR LIGHTNING
DAMAGE.

VACUUM CLEANER SYSTEM TYPICAL

The vacuum system is located in the aft stateroom under the forward bunk. Included is a netted bag of hoses and various vacuum attachments.

SAFETY WARNINGS

1. This is a dry vacuum system. Do not use on wet surfaces.

2. Never operate the vacuum without filters and bags in place.

3. Use careful monitoring when children are around. Do not let the vacuum cleaner be used as a toy.

4. Do not try to repair the vacuum as the unit is sealed. Return the unit to InterVac or an authorized reparir center for proper repairs.

5. Use only as described in this manual. Use only factory attachments and bags.

6. Do not use with any blocked openings. When the secondary filter becomes dirty, rinse in warm water or replace the filter. Filters must be completely dry before using.

7. Never drop or put any object into any opening.

8. Turn off the accessory breaker at the ship's AC panel to deactivate the vacuum cleaner.

9. Keep all body parts and clothing away from all moving parts.

10. Do not pick up anything that is burning or smoking such as cigarettes, matches, hot ashes or sharp objects. Do not use without dust bag or filters in place.

11. Do not attempt to operate the unit with a wet hose.

12. Do not store objects close to the vacuum unit.

13. Do not pick up flammable or combustible liquids such as gasoline, or use in areas where they might be present such as the bilge.

14. Do not step on the hose, nozzles or pull hard on the hose.

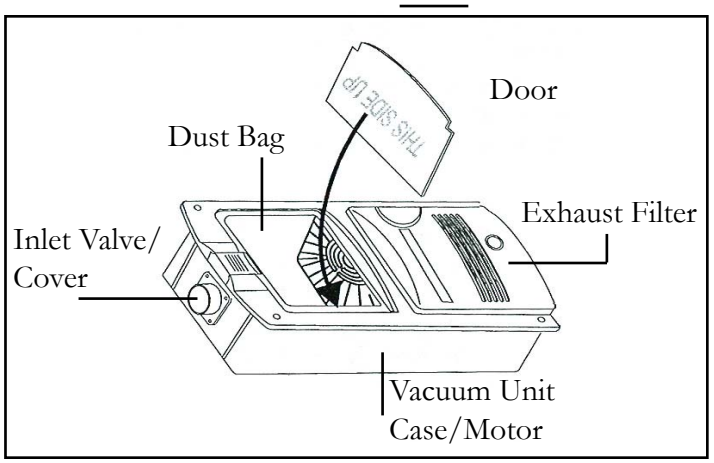
OPERATION

1. To operate the vacuum, the *accessory breaker* at the main ship's main AC panel must be turned to the "ON" position.

2. Lift the inlet cover on the vacuum unit.

3. Insert the hose cuff (one with the metal band) with a slight twist and the vacuum cleaner should start.

4. To remove, turn hose in either direction while pulling the hose toward you and the vacuum cleaner will stop.



Note:
If the motor stops the thermal protector on the unit will reset automatically after about 1/2 hour. This is normal for the vacuum cleaner.

Insert Hose Cuff Here

If The Motor Stops Suddenly:

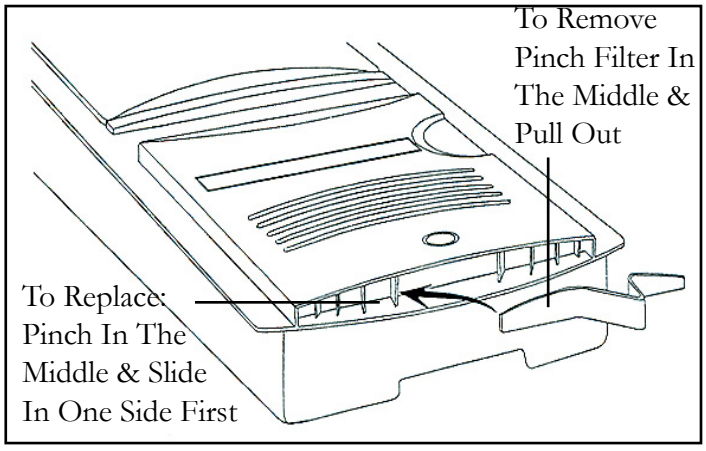
1. The most common cause is a clogged hose. Try to unclog the hose with a long object or by shaking the hose until the debris falls out.

2. The bag is overfilled and fine dust has clogged the bag.

3. The vacuum cleaning tools are clogged.

4. The motor (exhaust) filter is dirty and should be cleaned or replaced.

5. While the vacuum cleaner is being used keep the cushion up to provide additional air to the unit. This will help the unit from shutting down.



Replacing Exhaust Filter

EXTERIOR EQUIPMENT

ANTENNAE

The GPS/plotter antenna is located on top of the hard top on early models or under the forward deck on later models. The antenna includes a built-in position fixing receiver. The GPS plotter features a filter that compensates for the rolling motion of your boat for clearer course and speed information. The antennae are protected by individual plotter breakers.

UNDER DECK ANTENNAES SHOWN

TYPICAL HARD TOP ANTENNA LOCATIONS

The electronics installed on your vessel are NEMA 2000 compatible which permits system components to share information with other marine-network compatible devices. Refer to your GPS/ plotter owner's manual for further information.

Be aware of the vessel's bridge clearance specifications to avoid equipment/vessel damage due to impacting a bridge structure since a great portion of the antenna/receiving equipment is mounted on the hard top. Remember that the masthead light on the hardtop can be lowered if needed.

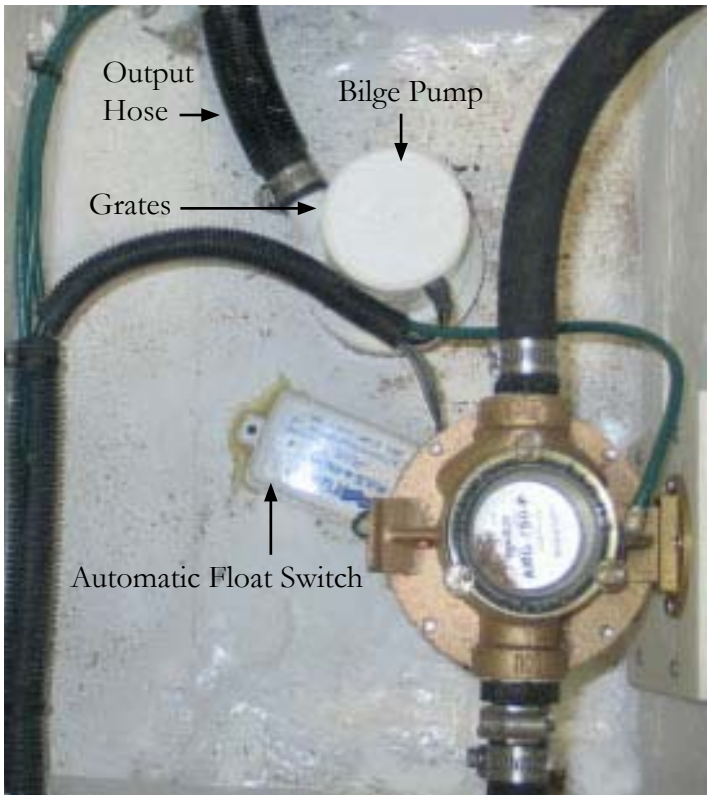
The VHF radio uses a whip style fiberglass antenna which is "trimmed" to provide the best output and reception.

The TV antenna mounted on the hard top is shaped liked a saucer.

The satellite weather antenna is now located under the forward deck.

For further information on antennas refer to each vendor's owners manual.

TYPICAL BILGE PUMP/FLOAT SWITCH



Your Regal boat features bilge pumps and float switches in the sump (bilge) and salon (selected models). They are operated through the helm switches. There are separate switches marked forward and aft bilge pumps.

In the "off" position both switches are connected into the automatic float switch. In this "auto" position if the boat takes on water, the bilge pumps will activate and pump excess water overboard. The switch will light up when activated.

Periodically check the grates for debris and spray the units down with water. Make sure a steady stream of water exits the through hull fitting indicating the entire output hose system from the bilge pump itself is debris free.

Monitor your helm bilge pump switch lights periodically during your cruise. If one of the lights is on that means that the bilge pump circuit is energied. Stop the vessel and find the cause of the problem.

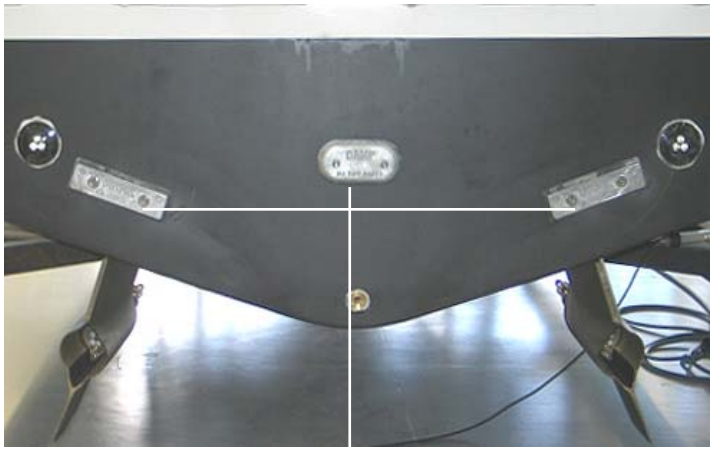
BOTTOM PAINT

As a factory option two coats of bottom paint are applied to your vessel. This product provides top-of-the-line antifouling protection. It contains the highest percentage of croupous oxide to aggressively combat even the worst tropical conditions. This product will help reduce annual hull maintenance.

The hard epoxy base produces the most durable finish for long lasting performance. If your vessel is left in the water the paint provides effective year round service.

Periodically check the bottom of the boat for growth. The vendor recommends scrubbing the bottom with a soft brush to remove anything from the antifouling surface. This scrubbing is particularly important with boats that are idle for extended periods.

Note: When touching up the bottom with epoxy paint wait at least 3 days before relaunching the vessel. On older models always leave at least 1 1/2" between any metal objects including anodes and the bottom paint to help prevent electrolysis. On later models there is a shim that assures the anode is a safe distance from the paint. These models can be painted right up to the anode edge. See the illustration.



Typical OceanTrac Bottom Using Shims Around Anodes

NOTICE

TO PROTECT AGAINST GALVANIC CORROSION
DO NOT USE BOTTOM PAINT ON ANODES.

CANVAS

With the standard radar arch a bimini top complete with Sunbrella canvas and stainless steel bows. The package includes the front windscreen, side and aft curtains.
For installation, refer to the canvas installation placard located in the owner's information packet. For canvas maintenance refer to the maintenance information found in chapter 8 or contact your Regal dealer.
As optional equipment a cockpit cover is available along with a foredeck sunpad cover and aft European sundeck cover.

COMPASS

The helm installed compass is set by the manufacturer to ensure its accuracy. If in doubt it can be zeroed in by using a non-magnetic screwdriver and turning the compensator screws as recommended. A compass can be checked while underway for variance and deviation by comparing your heading with a nautical chart or GPS. Compass error is part of the calculation. Refer to the compass manual in the owner's information packet for compensating details.

DOOR-TRANSOM

To open the transom door (gate style) pull up on the framework until the door hinge releases and swivels to the open detented position.
To close the door pull up on the framework until the door hinge releases and swivels to a closed detented position.

WARNING

PREVENT SERIOUS INJURY OR DEATH
FROM FALLING OVERBOARD!
KEEP THE TRANSOM GATE
IN THE LOCKED POSITION
AT ALL TIMES.

ELECTRONICS-GENERAL

Your boat features several electronic components matched for compatibility. Manuals for each of the electronic components should be referenced for specific **detailed** operations. These manuals are part of the owner's information packet.
Going through each piece of electronics while at the helm with the manual will greatly decrease the learning curve time.

Note: As an integral part of upgrading our product line Regal reserves the right to change specifications, components, locations, and vendors at any time.

FIRE EXTINGUISHER- AUTOMATIC

OVERVIEW

The Fireboy automatic fire extinguishing system is located in the bilge at the forward engine bulkhead. See the illustration. The system uses a environmentally friendly agent FE-241 which has been approved by the EPA to replace the old Halon agent. This system is formulated only for use in the engine space or bilge of your vessel. FE-241 is to be used with gasoline fuel systems only since the agent will not "stall" diesel engines. This could cause a fire to re-flash.

OPERATION-AUTOMATIC

Fireboy systems are not nor are they intended to be explosion suppression devices. **Boat owner's still need to take normal precautions for checking fumes and using blowers.**

Read the information in chapter 4 regarding the dash installed portion of the fire extinguisher system. When the system actuation starts you may hear a loud sound simiar to that of small arms fire, followed by a rushing air sound.

The system will show actuation whenever the ignition key is ON and the indicator light is OFF. The actual actuation time when a fire occurs is dependent on the severity of the fire.

When the automatic fire extinguisher activates IMMEDIATELY SHUT DOWN ALL ENGINES, POWERED VENTILATION (BLOWER), ELECTRICAL SYSTEMS AND EXTINGUISH ALL SMOKING MATERIALS. DO NOT OPEN THE ENGINE COMPARTMENT IMMEDIATELY!

Allow the agent to "soak" the compartment for a period of time and wait for hot metals and any fuels to cool before inspecting for the fire cause. Premature opening of the engine compartment allows an in-rushing of oxygen and could result in a flash-back. When the engine compartment is opened have approved portable fire extinguishers ready to use.

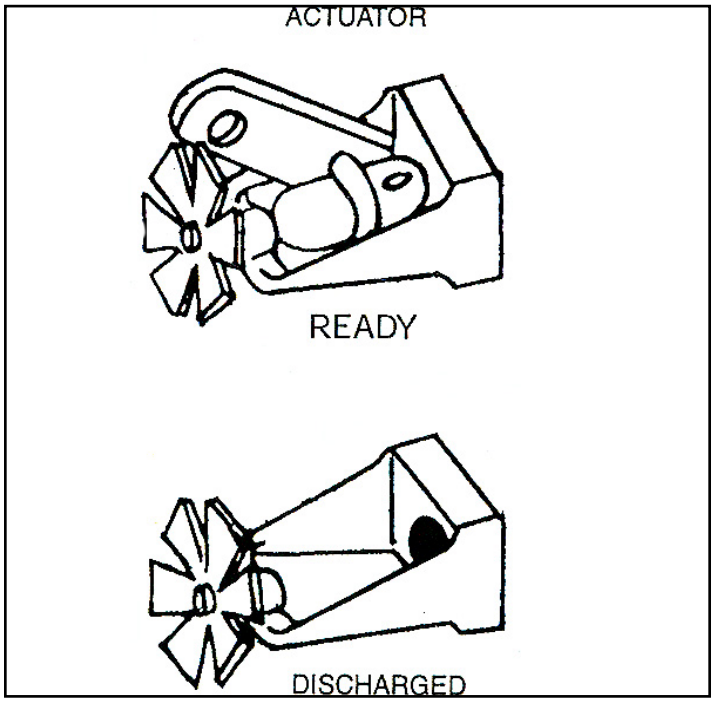
OPERATION-MANUAL

If a fire has started in the engine compartment where the Fireboy is located, DO NOT WAIT FOR AUTOMATIC ACTIVATION. **Release the system manually.** Close any opened hatches leading to the engine compartment, shut down all forced ventilation devices, engines, generators and electrical components. **Remove the safety pin from the "Fire" T-handle, and pull T-handle firmly and release. A loud "rushing" or air" sound will be heard.** Complete discharge will take several seconds. DO NOT OPEN THE COMPARTMENT IMMEDIATELY! Keep the compartment closed for a period of time sufficient to allow the agent to soak all areas of the protected space. This allows hot metals to cool.

Premature opening of the compartment could cause a re-flash. When opening the engine compartment for inspection have hand held portable extinguishers ready.
Inspect the pressure gauge and system before and after each outing. Refer to the maintenance chapter for caring for your fire extinguisher system.
The illustration opposite shows the actuator not discharged at the top and one which has been discharged at the bottom.

Typical Portable Fire Extinguisher

Portable fire extinguishers are found in various cabin and cockpit lockers. A label installed on the exterior cabinet doors identifies portable fire extinguisher locations. Know the location of portable fire extinguishers and perform periodic inspections.



WARNING

AVOID SERIOUS INJURY OR DEATH!
DO NOT BREATH FUMES OR VAPORS CAUSED BY A FIRE AS THEY ARE HAZARDOUS AND TOXIC.

WARNING

AVOID SERIOUS INJURY OR DEATH!
ACCIDENTAL DISCHARGE COULD OCCUR DURING HANDLING, INSPECTION, OR WORKING IN THE ENGINE COMPARTMENT.
WEAR EYE PROTECTION AT ALL TIMES!

GENERATOR-TYPICAL

OVERVIEW

As optional equipment on current vessels gasoline generators are rated for domestic use at 7.5 KW (120-240 volts, 60 hertz) and European units are rated at 7 kw (240 volts, 50 hertz). Diesel generators are rated at 9 KW. All meet current EPA, CARB and CE emission requirements.
Detailed maintenance information can be found in the generator operating manual.
For further generator information see chapter 4 of this manual and the generator's operation manual for more detailed information.

OPERATION

Perform the following inspections and checks before each startup, as designated, and at regular intervals as noted in the service schedule.

1. **Air Inlets**- Check for clean and unclogged air inlets.

2. **Air Shrouding-** Ensure the enclosure is securely fastened and positioned correctly.

3. **Battery-** Check for proper electrolyte level. Make sure all battery connections are secure.

4. **Coolant Level-** Check the reservoir for proper levels.
5. **Exhaust System-** Check for exhaust leaks and blockages. Check the silencer and piping condition and check for tight exhaust component connections.
Inspect the exhaust parts (exhaust manifold, catalyst, exhaust hose, hose clamps, silencer and outlet flapper) for cracks, leaks and corrosion.

Check hoses for cracks, softness, dents, or leaks. Replace as necessary.

Check for corroded or broken metal parts. Replace as necessary.

Check for loose, missing or corroded hose clamps. Replace or tighten the hose clamps and hangers as needed.

Check that the exhaust outlet is unobstructed.

Visually inspect for exhaust leaks (blow-by). Check for carbon or soot residue on exhaust parts which indicate an exhaust leak. Seal leaks as needed.

HARDTOP

The hardtop option is made of reinforced spaceage aluminum. It features side windows for increased visibility. The unit has integrated raceways to run electronic equipment wiring.

Additional light is afforded by ceiling fixtures. Varous equipment is mounted on its top including antennaes, air horn, radar options, and hand holds for accessing the forward working deck via the deck sides.

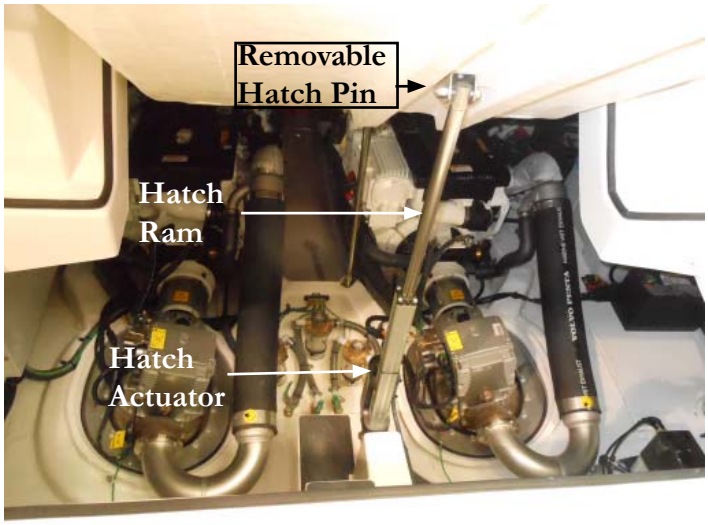
⚠ WARNING

TO PREVENT BODILY INJURY
DUE TO FALLING
DO NOT STEP ON THE HARDTOP!
USE THE WALK-AROUND LOWER DECK
AND HANDRAIL SYSTEM
OR THE CENTER WINDSHIELD WALK
THROUGH TO ACCESS ANY HARDTOP
COMPONENTS.

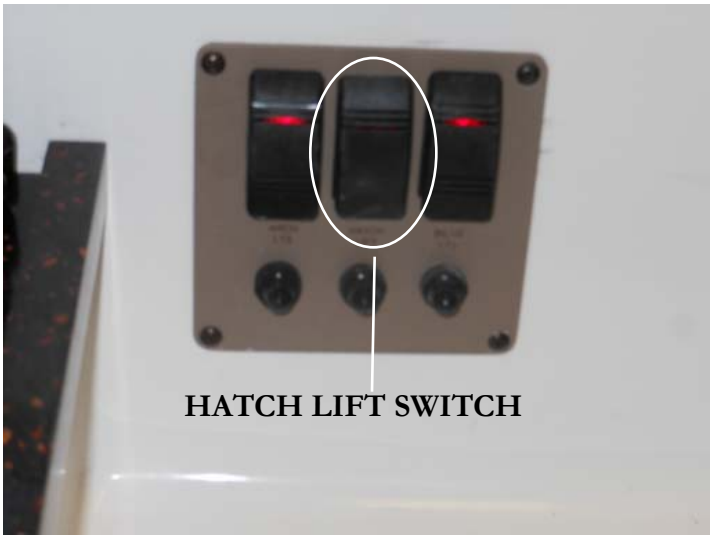
HATCH-ENGINE (TYPICAL)

The engine hatch provides easy access for periodic bilge and equipment inspections. Use the ladder and walk-way to access the bilge from the day hatch. Be careful not to slip while climbing the ladder rungs especially if you were working around the engines. Your feet may have picked up some oil deposits or lubricants from engine components.
The engine compartment hatch switch and (bilge) lights can be accessed at the starboard stairway exterior panel. Also, additional overhead lighting is available at the engine area by activating the overhead and courtesy light switches on the same panel. All light switches are individually protected by circuit breakers.
Since the hatch is electric and forward facing it is easiest to access the engine compartment from the aft to check engine and generator fluids.
The engine hatch uses heavy duty electric-hydraulic rams to operate up and down. Should the need arise there is a top pin which can be pulled to permit the hatch to be lifted manually in case of emergencies.

Note: Manually lifting the engine hatch requires additional manpower and the proper blocking to hold the hatch up. Do not try this procedure alone.



Typical Hatch



HEATER-HOT WATER

The hot water heater features an eleven gallon capacity and has recirculating ability to keep water warm during cruising. This is accomplished by a set of hoses connected between the hot water tank and the circulating engine water pump. Engine coolant runs through a heat exchanger which keeps the tank water warm when the engines are running.

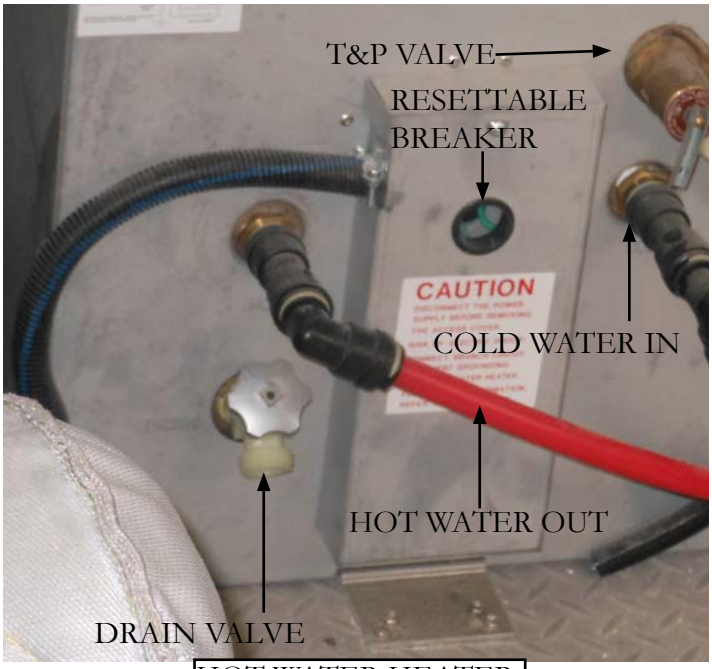
To initially fill the hot water heater, ensure the boat's fresh water tank is full. When the tank is full water will be seen at the deck vent. At the DC side of the main ship's AC/DC panel, turn the fresh water pump to the "on" position. **Make sure the water heater is full of water by opening a hot water faucet until a steady stream flows out.** With the generator running or the shore power connected, switch on the hot water heater at the AC side of the ship's service panel. The heating element will now begin to heat the hot water tank.

Should the hot water heater reset button need to be activated on *older* heaters, turn off the hot water breaker at the AC side of the main control panel. Then remove the panel cover to expose the reset button. Press the red reset button. On *newer* models there is a round access port on the rear panel to reach and reset the breaker.

Should the need arise there is a drain valve located at the rear of the heater. Always turn the hot water breaker to the "off" position before opening the drain valve. Make sure the water is cold before attempting to open the valve. **The valve runs through the shower sump pump and then overboard.** Never try to adjust the thermostat or open the drain valve before turning off the AC breaker. Contact a marine professional for further information.

CAUTION

TO AVOID POSSIBLE BODILY INJURY DUE TO ELECTRICAL SHOCK DO NOT TRY TO OPEN UP THE HOT WATER TANK COMPONENTS WHILE THE AC POWER IS ACTIVATED. TURN HOT WATER BREAKER OFF AT THE MAIN AC PANEL.



HOT WATER HEATER

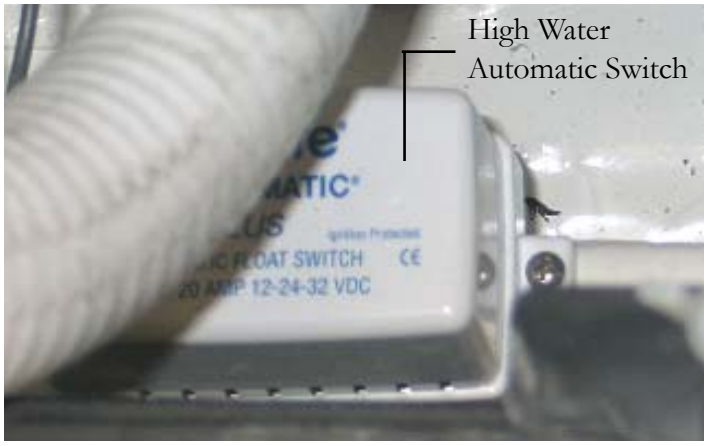
CAUTION

TO AVOID POSSIBLE BODILY INJURY DUE TO HOT WATER, BE SURE TO CHECK THE WATER TEMPERATURE BEFORE USING IT. THIS IS ESPECIALLY TRUE AFTER CRUISING WHEN THE WATER HAS BEEN TRAVELING THROUGH THE HEAT EXCHANGER HOSES.

NOTICE

TO AVOID EQUIPMENT DAMAGE DO NOT TURN ON THE HOT WATER BREAKER WITHOUT THE WATER HEATER BEING FULL. DAMAGE TO THE HEATER ELEMENT WILL OCCUR.

HIGH WATER ALARM-BILGE



The high-water alarm warns the skipper of a possible emergency in the bilge area. There is an automatic float switch installed in the center bilge. If the water rises over a predetermined level the bilge switch sends a signal to the helm mounted alarm. This sump float switch normally is elevated from the position of the automatic bilge pump switches.

If the alarm sounds bring the vessel back to an idled position in neutral and turn off the engines. Open the engine hatch and find the cause of the problem.

Possible causes are:

1. Engine or generator hose leak.
2. IPS gasket leak between hull and drive.
3. Mufflers or exhaust hose leak.
4. Hull leak due to striking an object.
5. Water or waste tank leak.
6. Seacock leak.
7. Heat exchanger leak.
8. Transducer or underwater light leak.
9. Water heater tank or heat exchanger hose leak.

MARKERS-FOR SLINGS

Sling markers are located on the forward and aft deck near the rub rail. These markers provide a safe location to locate straps to lift the boat. Failure to use marked sling marker locations could cause damage to the boat structure.
When lifting the vessel close all doors, hatches and port-lights. Make sure the spreader bars are adjustable enough to be wider than the sling beam area. This will allow the slings to hold the weight of the boat properly without forcing the boat structure inward. Make sure there is no pressure on the rub rail as the aluminum extrusion shape can be distorted along with the insert.
Always use a flat wide belt-style straps as they distribute and hold the boat weight in a more supported fashion. Do not use the cable-style straps since they may cause hull or rub rail damage.
If sling markers are not found on the vessel contact your closest Regal dealer for further information before attempting to lift the vessel.

Note: The sling markers are located at the forward and aft sections of hull on both port and starboard sides. Align the straps evenly on both port and starboard sides before lifting vessel. This will assist in keeping the hull load evenly distributed.

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH
DUE TO FALLING!
NEVER REMAIN IN THE VESSEL
WHEN IT IS BEING LIFTED BY SLINGS!

NOTICE

AS A SAFETY PRECAUTION,
WHEN THE BOAT IS LIFTED,
TIE A LINE BETWEEN BOTH STRAPS
TO PREVENT THE STRAPS FROM MOVING
FORWARD OR AFT.

NOTICE

TO AVOID POSSIBLE STRUCTURAL DAMAGE,
SET VESSEL FOR EXTENDED STORAGE
ON A FACTORY APPROVED
AND ADJUSTED STEEL CRADLE.
NEVER USE BLOCKING TO SUPPORT THE
VESSEL'S HULL BOTTOM.

TYPICAL AFT SECTION

TYPICAL FORWARD SECTION

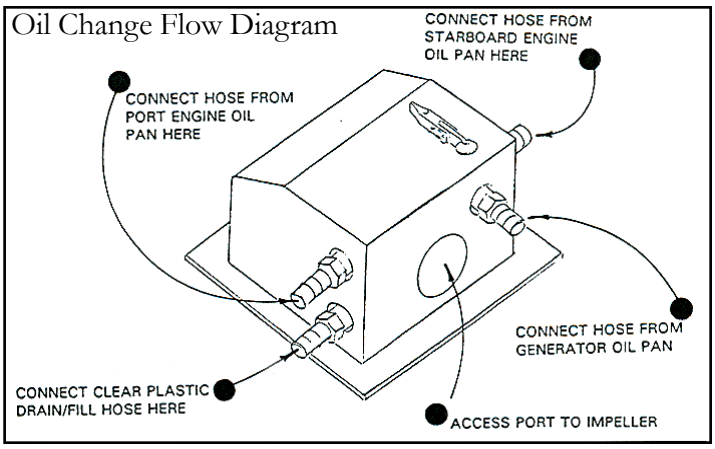
OIL CHANGER

As optional equipment an oil change system is installed on the forward bulkhead of the engine room. It is designed to remove crankcase oil from two engines and a generator in diesel vessels. Also, the unit refills each crankcase oil pan with fresh oil through a system of hoses and an integrated pump.

Note: This unit does not drain or refill the transmission housing because these engines use a separate type fluid for the transmission.

The oil change system is housed in a fire retardant, high impact, high gloss case. The pump is solid brass with a special self-priming type impeller which pumps instantly whether in the drain or fill mode.

Power is supplied through the vessel's 12 volt DC system. There is a 20 amp breaker found on the DC distribution panel which is located on the forward engine bulkhead. It protects the system against overloads.


Oil Change Flow Diagram
CONNECT HOSE FROM STARBOARD ENGINE OIL PAN HERE
CONNECT HOSE FROM PORT ENGINE OIL PAN HERE
CONNECT HOSE FROM GENERATOR OIL PAN
CONNECT CLEAR PLASTIC DRAIN/FILL HOSE HERE
ACCESS PORT TO IMPELLER

START-UP PROCEDURES

When starting the system for the first time, air will be in all of the lines. To prevent pump and or system damage follow the procedure outlined below:

1. Insert the PVC wand of the Drain/Fill Hose into a container holding a small amount of fresh oil.

2. Release the fail-safe lock device on the Pump/Motor Unit valve handle and direct the arrow-shaped tip to "Starboard".

3. Flip the motor control switch to the "Fill" position. The pump will start immediately and you will see the oil moving through the clear plastic tubing toward the Pump/Motor Unit. You will hear a noticeable change in sound (speed) of the pump motor when oil enters the pump.

4. Continue to operate the pump for 5 to 10 seconds after pumping action begins, then return the Pump/Motor switch to the "OFF" position and secure the oil fill cap.

3. Loosen the oil filler cap on the engine or remove the dip stick to allow air to enter the crankcase.

4. Release the fail-safe lock device on the Pump/Motor Unit valve handle and direct the arrow-shaped tip to "PORT ENGINE".

CAUTION

AVOID EQUIPMENT FAILURE!
IF OIL DOES NOT MOVE QUICKLY THROUGH THE CLEAR TUBING TOWARDS THE PUMP, TURN THE SWITCH TO THE OFF POSITION, ELEVATE THE CLEAR TUBING AS IT NEARS THE ENTRANCE OF THE PUMP, THEN FLIP THE SWITCH TO THE FILL POSITION AGAIN.

This will lubricate the pump and insure a good starting vacuum.
Run the engine to be drained until it reaches 140 degrees. This will insure that the oil can be removed easily. Shut the engine down and allow ample time for the recirculated oil to return to the oil pan.

DRAINING THE PORT ENGINE

1. Warm engine to at least 140 degrees and turn the key off.

2. Insert the PVC wand of the drain/fill hose into an environmentally friendly waste container since you are responsible for disposing of waste properly.

5. Flip the motor control switch to the "DRAIN" position. The pump will start immediately. You should hear a noticeable change in the sound (speed) of the pump motor when the used oil enters the pump.

6. Continue to operate the pump until there is a noticeable change in the sound (speed) of the pump motor, which is an indication air is being drawn into the crankcase oil hose and the crankcase is now empty. The oil drain rate is about one gallon per 22 seconds.

7. Return the pump motor control switch to the "OFF" position when the crankcase is empty and place the fail-safe switch in the "OFF" position.

DRAINING THE STARBOARD ENGINE

1. Repeat each of the steps outlined in "Draining the Port Engine" after switching the arrow-shaped tip on the valve handle to the "STARBOARD ENGINE".

2. Flip the motor control switch to the "DRAIN" position.

3. Once the crankcase is emptied, return the pump motor control switch to the "OFF" position and place the fail-safe switch to the "OFF" position.

DRAINING THE GENERATOR

1. Repeat each of the steps outlined in "Draining the Port Engine" after switching the arrow-shaped tip on the valve handle to the "GENERATOR ENGINE".

2. Flip the motor control switch to the "DRAIN" position.

3. Once the crankcase is emptied, return the pump motor control switch to the "OFF" position and place the fail-safe switch in the "OFF" position.

FILLING THE ENGINES

Note: If you are using this unit for the first time to fill the engine crankcases be sure to read and follow the information in the "START UP section.

1. Before attempting to fill an engine, make sure the engine has been completely drained or is in need of a measured amount of additional oil. DO NOT OVERFILL!

2. Determine the type and the amount of oil recommended by the engine manufacturer for each engine.
Remember 4 quarts = 1 gallon

3. There are two commonly used methods to determine when the proper amount of oil has been delivered to the engine.

Pre-measured Method- this method requires the operator to set aside a known quantity of oil prior to filling. For example, if the engine requires 6 quarts of oil, the operator may want to pump from a gallon container, adding 2 additional quarts as the container empties.

Timed Method- the timed method is used when pumping from a container of unknown capacity or a reservoir. The flow of oil through the system varies primarily with the viscosity and temperature of the oil.
Under normal conditions the system pumps 4 quarts of 40 weight oil in approximately 90 seconds. Filling time is a function of several factors, including the oil temperature and weight. Oil (40 weight) at 85 degrees F. pumps about 20% faster than the same oil at 75 degrees F.

Note: Fresh oil should be 75 degrees F. or warmer before pumping.

FILLING THE PORT ENGINE

1. Loosen the oil filler cap on the engine or remove the dip stick to allow air to enter the crankcase.

2. Insert the PVC wand of the Drain/Fill Hose into a container of fresh oil.

3. Release the fail-safe lock device on the Pump/Motor Unit valve handle and direct the arrow-shaped tip to "PORT ENGINE".

4. Flip the pump motor switch on the X-Change-R to the "FILL" position. The pump will start immediately and you will observe the oil moving through the clear tubing toward the Pump/Motor Unit. You should hear a noticeable change in the sound (speed) of the pump motor when oil enters the pump.

5. Continue to operate the pump until a measured amount of oil has been pumped into the engine's crankcase. Fresh oil is pumped at the rate of about one gallon each 90 seconds.

6. Flip the pump motor control switch to the "OFF" position when the oil pan nears its filled capacity and check the proper oil level with the engine's dipstick. If filling is completed, place the fail-safe switch in the "OFF" position.

Note: If you have an over-filled engine, you may simply flip the motor control switch to the "DRAIN" position for a few seconds to remove the extra oil.

FILLING THE STARBOARD ENGINE

1. Repeat each of the steps outlined in "Filling the Port Engine" after switching the arrow-shaped tip on the valve handle to the "STARBOARD ENGINE".

2. When the oil pan nears its filled capacity, flip the pump motor control switch to the "OFF" position and check the proper oil level with the engine's dipstick. If filling is completed, place the fail-safe switch in the "OFF" position.

FILLING THE GENERATOR

1. Repeat each of the steps outlined in "Filling the Port Engine" after switching the arrow-shaped tip on the valve handle to the "GENERATOR" engine.

2. When the oil pan nears its filled capacity, flip the pump motor control switch to the "OFF" position and check the proper oil level with the engine's dipstick. If filling is completed, place the fail-safe switch in the "OFF" position.

OVERBOARD DISCHARGE PUMP (MACERATOR) TYPICAL

The overboard discharge pump (macerator)) can be used to pump out the holding tank in international waters. When the monitor panel key is energized to the full start position, the macerator engages to pump the tank waste overboard. *Again, make sure it is legal to pump the waste overboard before you start the operation*. Also, open the waste seacock located in the sump. The pump can be disconnected from the 2 union fittings that hold it for maintenance purposes. The pump is rated for 40 minutes continuous operation. Do not flush paper or feminine hygiene products into the waste system. Keep toilet tissue usage to a minimum. Do not use bleach or toilet cleaners in the waste system. Use only maine approved products. Rinse and flush the holding tank after each pump out. This will dilute any residual waste, and help prevent blockage and reduce odors.

FRESH WATER & WASTE MONITOR WITH OVERBOARD DISCHARGE

TYPICAL OVERBOARD DISCHARGE PUMP

The impeller grinds up the waste as it passes through the macerator. On the macerator shown above the system is protected by a 10 amp breaker located at the salon main DC distribution panel.

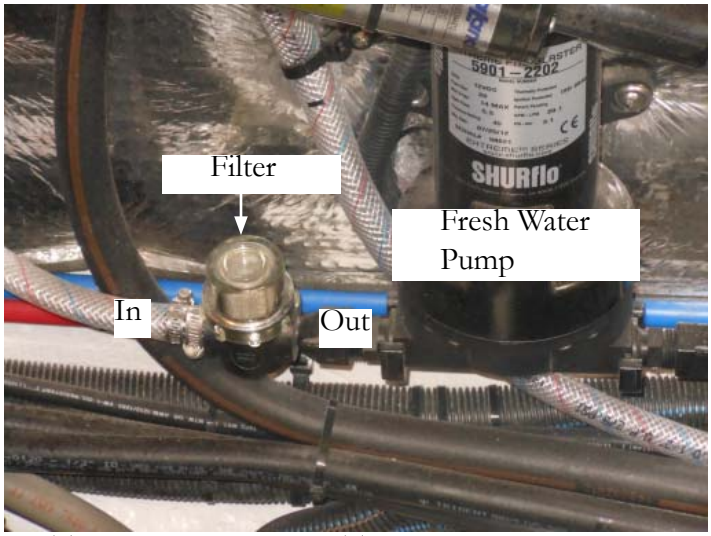
PRESSURE PUMP-FRESH WATER

Your vessel features a variable speed fresh water pressure pump. The variable speed allows for additional water flow at peak times such as using the forward and aft showers at one time. It is important not to operate the pump unless there is water in the fresh water tank. The pump is controlled by a breaker on the main DC control panel. Energizing the switch allows the pump to build the water pressure in the distribution lines to 35 psi's.

When the pump reaches a level of 35 psi the pump should automatically shut off. If the system drops below a certain pressure then the variable speed pump will restart. If the pump cycles on and off with no water being used, a leak in the water system is likely.

Periodically remove the water inlet filter and clean it. Additional filters can be ordered through your Regal yacht dealer or marine outlets.

Be sure to turn the fresh water pump at the main salon DC panel off before performing any type of maintenance.



TYPICAL FRESH WATER PUMP

SATELLITE RADIO-TYPICAL

This *option* is currently available on all Regal models. Sirius satellite radio features over 120 channels of music entertainment completely commercial-free along with sports and news channels. Sirius emphasizes the music and entertainment you want. Channels use the most updated digital filtering available for the clearest sound. Sirius uses three satellites flying over the United States for coast to coast coverage with high elevation angles. The result is a clearer line of sight and less signal blocking.
The system consists of the stereo receiver (sometimes called the head unit), radio tuner and antenna. With these components and an active account initialized by the customer on delivery your Sirius system should be ready to operate.

Following are the activation steps to be taken:

A. Unit must be completely installed and the antenna must have a clear view of the sky.

B. Turn on the radio and go to satellite mode.

C. Confirm reception by tuning to SIRIUS WEATHER & EMERGENCY//CHANNEL 184. If you are not receiving Channel 184, please refer to the radio manufacturer owner's manual.

D. Call SIRIUS sales support 1-888-465-8516 or customer care 1-888-539-7474.

E. Please have your name, address, phone number and the SIRIUS ID#ESN available for the agent.

SIRIUS MARINE WEATHER-TYPICAL

This option provides peace of mind and safety by allowing the captain to access the latest weather information through satellite. The data can be viewed through the "E" series GPS/Plotter (option) at the helm or the salon television. The service provides comprehensive weather data and state-of-the-art forecasting including buoy reports, WSI NOWRad® (nationwide high-resolution weather radar imagery) to anticipate coming trouble and high-resolution sea surface temperatures that can help fisherman.
Subscribers can use the SIRIUS satellite footprint which blankets 48 contiguous states, most of Canada and Mexico; and waters extending hundreds of miles into the Atlantic and Pacific oceans, the Gulf of Mexico and Caribbean.

SIRIUS MARINE WEATHER ACTIVATION

1. Power up the receiver by activating the power button on the "E" series GPS/Plotter.

2. Dial 1-800-869-5480 to activate the service. The customer normally carries out this operation. Regal supplies a 6 month subscription for the customer.

3. Be prepared with your billing information, subscription preferences and the SIRIUS ID# for your receiver.

4. The SIRIUS ID# of your receiver will be viewable via the "E" series GPS/Plotter.

OVERVIEW

The following information is for United States weather only. A Navtex receiver must be used for worldwide weather.
The weather application superimposes historical, live and forecasted weather graphics and their associated weather data on the "E" series GPS/Plotter. All this information allows the skipper to determine the actual conditions in his vicinity or at another location. Weather forecasts and warnings, detailing current and preferred conditions are updated often using the WSI NOWRad® system.
For types of warnings, watches and advisories, please refer to the NOAA website at www.nws.noaa.gov.

SPOTLIGHT-TYPICAL

The "5" spotlight/ floodlight uses a high-powered, dual focus sealed beam bulb. With an output of 72,000 candlepower, the unit can illuminate objects up to 1/4 mile away. Notwithstanding, the 30,000 candle power spotlight is perfect for docking or mooring. The unit rotates up to 350 degrees and includes a vertical arc of 70 degrees and an easy to use "joystick" style remote control. The spotlight uses a 12 volt operating system and is constructed of stainless steel or chrome brass for years of carefree service.

The spotlight control panel uses a 2 way switch to control the type of light output. To control the direction a 4 position joystick style switch is used.

The 2 way switch in the center position is "off". In the "up" position the light output is a spotlight. In the "down" position the light output is a floodlight.

To move the light upward press and hold the joystick "up".

To move the light downward press and hold the joystick "down".

To move the light counterclockwise press and hold the joystick to port until the desired directional movement is achieved.

To move the light clockwise press and hold the joystick to starboard until the desired directional movement is achieved.

If storing the vessel outside in colder climates turn the spotlight so the lens faces the stern of the boat to help prevent a broken lens due to unidentified flying debris. Of course another option would be to cover the lens face.

SUN LOUNGER-EURO DESIGN

The aft cockpit Euro sun lounger is extra wide for comfortable lounging. The headrest can be positioned for multiple positions.

SUNPADS

The forward deck features dual sunpads. Each sunpad cushion is lightweight making it easier to transport to the deck and easier to store. The backrests can be individually adjusted to several postions.The dual foredeck sunpad must be used only when the boat is stopped to avoid anyone falling overboard.

Make sure the cushions are snapped down securely. *It is a good idea to store the sunpad cushions when not in use to prevent them being blown overboard should the yacht encounter inclement cruising weather.*

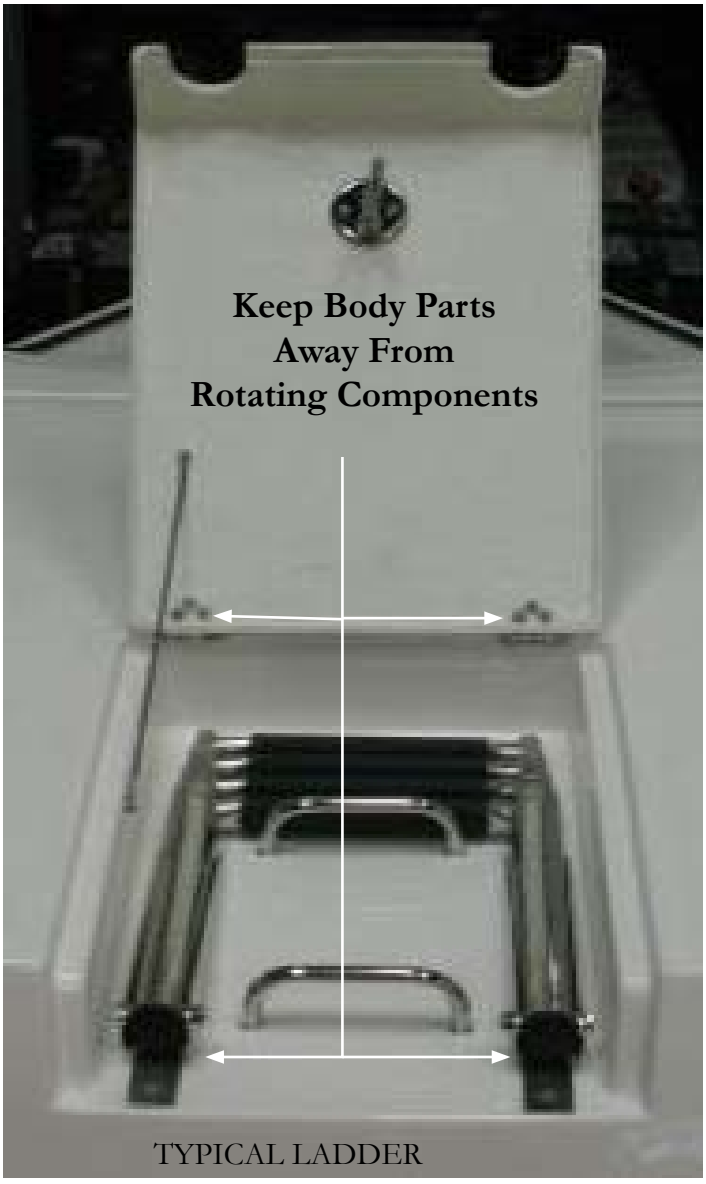
WARNING

AVOID SERIOUS INJURY OR DEATH
DUE TO FALLING OVERBOARD!
DO NOT USE THE DECK
SUNPAD WHILE BOAT IS MOVING.

SWIM (BOARDING) LADDER-TYPICAL

When using the swim (boarding) ladder open the hatch and slide the ladder out to the end of the travel. Then flip the ladder over and let it down gently. Make sure you keep your hands and fingers clear of any moving ladder parts especially the hinged top.

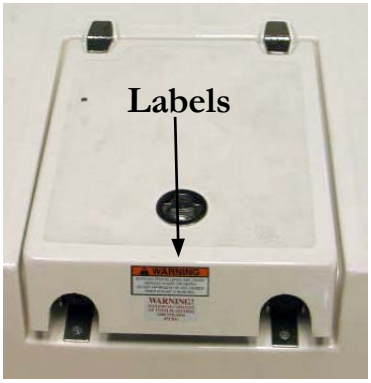
When not using the swim ladder be sure to keep the ladder cover over the ladder to prevent tripping and falling accidents.



TYPICAL LADDER

Insist that only one person use the ladder at a time. When finished with the ladder flip up the lower section of the ladder and slide the ladder assembly in as far as possible. Lower the fiberglass ladder cover to secure it.

Periodically check the ladder hardware for tightness and corrosion. Replace fasteners and lubricate hinges as needed.



Read and understand all warning and information labels found on the swim platform and ladder cover. Never exceed the maximum poundage recommended for the swim platform as noted on the label.

WARNING

TO AVOID BODILY INJURY
TURN THE ENGINES AND GENERATOR OFF
AND REMOVE THE IGNITION KEYS
WHILE PEOPLE ARE SWIMMING
NEAR THE VESSEL AND/OR USING THE
SWIM PLATFORM OR LADDER.

SWIM PLATFORM

The swim platform is used with the boarding ladder to enter and exit the water. Never dive from the swim platform or swim under it. The swim platform is not intended to be used for storing heavy objects. Keep the platform surface free of objects to prevent bodily injury due to falling. Periodically inspect all swim platform fasteners and stanchions under the platform for tightness and corrosion. Replace parts as needed.

Do not exceed the swim platform recommended poundage capacity.

Use the swim platform cleats for temporary tying only such as stopping at an on-the-water restaurant or fuel dock. Use the other deck cleats for permanent moorings. When securing lines leave enough slack for local tidal changes. **Never use the swim platform cleats for towing! Never attempt to lift the boat using the swim platform cleats or any other cleats on the vessel!** See the section on sling markers. Never swim around or under the swim platform while the engines are running due to the effects of carbon monoxide poisoning. **Read and understand all CO labels in the safety on board chapter.**

TYPICAL SWIM PLATFORM

WARNING

TO AVOID BODILY INJURY
TURN THE ENGINES AND GENERATOR OFF
AND REMOVE THE IGNITION KEYS
WHILE PEOPLE ARE SWIMMING
NEAR THE VESSEL, USING THE SWIM
PLATFORM OR LADDER.

WARNING

AVOID SERIOUS INJURY OR DEATH!
NEVER OPERATE THE VESSEL
WITH PEOPLE ON TOP OR HOLDING ON TO
THE SWIM PLATFORM
STRUCTURE OR HARDWARE.

UNDERWATER LIGHTING

OVERVIEW

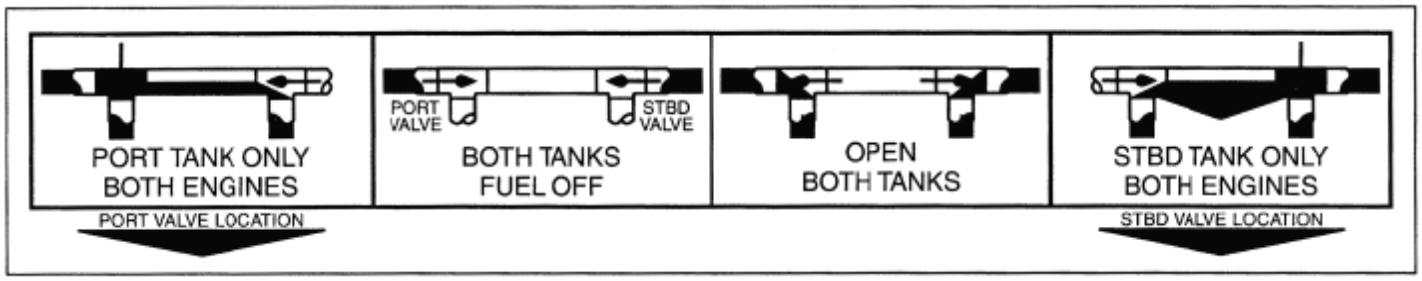
The underwater light option provides high output, long life and low heat emission. The lights are made from a high impact resistant polycarbonate housing. The lights are installed under the transom for maximum efficiency. Their beam is blue for increased underwater penetration.

OPERATION

The underwater lights are energized through a switch located at the helm switch panel. The unit is sealed for underwater use.

Typical Underwater Light Shown

VALVES- FUEL TANKS/GENERATOR



Fuel Tank Selector Valves

The fuel tank selector valves are found on the firewall bulkhead. The system controls the flow of fuel from both fuel tanks.
When one tank's fuel is low change to the other tank for-balancing the fuel levels. Failure do to this could cause the engines to injest air through the lines causing a lean fuel condition.
Set the valves to the desired fuel flow by turning them in the proper direction. Use the label shown above. You can feel the valves seat in the detented position. When leaving the vessel, turn off both fuel selector valves.

Note: If running the generator the port fuel tank will empty faster than the starboard tank.
Note 2: In normal operating conditions the engines will not detete the fuel tank levels at a perfectly even rate. Use the fuel gauges but always use the 1/3 rule when cruising.

Generator Fuel Valve

The generator valve functions similar to fuel tank selector valve.
Monitor the fuel gauge so both fuel tanks stay fairly even when using the generator. When one fuel tank is quite a bit lower than the other fuel tank, just change the fuel selector valve. When leaving the vessel, turn off the generator fuel control valve.

Cosmetic Care & Maintenance

COSMETIC CARE

This chapter covers the general care of your Regal boat. Be sure to read and understand all vendor supplied information on cosmetic care. Many cosmetic care topics are described and expanded in the following pages. For selected items there may not be specific vendor information available in the owner's information packet. Therefore, we have provided customer cleaning information as needed on each of these topics.

Where cleaning methods are suggested try them on a small area before applying to the entire surface. Never use toxic or caustic chemicals on your boat. Read and understand each cleaning agent before using it. The labels will alert you to limitations and safety information for each cleaner.

Never mix cleaning agents since this may produce an unsafe chemical reaction which could be toxic, produce fire or explosion and/or effects that may be harmful to the human body.

Provide fresh air while using cleaning agents to reduce any effects of chemical inhalation by opening hatches, portlights and the main companionway door. It is recommended to vacate the area until any chemical odors are diminished.

Most of all, use common sense!

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BILGE/ENGINE COMPARTMENT

Always keep the bilge pumped out and free of accumulated debris. If oil accumulates on the engine compartment floor becomes it is usually related to engine oil lines, a loose component such as an oil filter, oil pan drain bolt or a leaky gasket/O-ring. Always find the cause of smaller problems before they become larger more expensive ones.

The engine compartment, bilge or sometimes called the sump features a light colored gel finish that will be beneficial in finding leak sources.

A periodic bilge cleaning with a brush and bilge cleaner (purchase at a marina or supplier) will be helpful in maintaining an orderly and safe bilge since accumulated dirt and fluids could cause someone to fall. *Do not pump bilge contaminated oil overboard but deploy it to a waste receptacle for recycling.* Check the fuel system including all hoses, tanks and connectors for possible leaks and deterioration. A stained area normally could suggest a hose or connection leak.

Inspect all wiring including connectors and hangers for tightness. Clean fuel filters as suggested by the engine manufacturer.

Check all engine and water/waste hoses for tightness and deterioration. Tighten all hose clamps as needed.

Check all battery hardware and terminal connections. Fill the battery cells with distilled water (wet-cell type only) to the battery manufacturer's suggested level.

Check the transom area for loose hardware. With IPS systems refer to the vendor owner's manual for any engine room maintenance on the stern drive system.

Do not use any flammable products in the bilge. Use environmentally approved procedures to dispose of oily or soiled cloths.

BOTTOM PAINT

Bottom paint in fresh water normally accumulates a bit of algae and slime over a period of time even more so if the vessel is not used. Most of this can be wiped off with a turkish towel or the back side of a piece of rug while the boat is in the water. Stay away from using a stiff bristle brush, wire brushes or abrasive materials which may harm the bottom paint barrier.

If used in saltwater the bottom may have accumulated some barnacle growth. Sometimes a diver can be hired in lieu of hoisting the vessel to clean the growth.

Periodically, the best way to inspect the bottom is to have the boat lifted out. Make sure the straps are evenly lined up with the sling markers on the deck. Look for scrapes in the gelcoat along with any loose or damaged underwater hardware.

Also, this is an excellent time to check for damaged propellers and underwater hardware. The hull bottom and paint should be inspected annually and touched up as needed by your Regal yacht dealer.

Make sure to leave the required spacing (at least 1") when touching up to protect hull components ie; trim tabs, drive parts, anodes from electrolysis potential. Never paint any of the above mentioned parts with bottom paint.

NOTICE

WIRE BRUSHES, SCOURING PADS, OR OTHER ABRASIVE TYPE MATERIALS AND SOLUTIONS SHOULD NEVER BE USED ON THE HULL OR DECK OF YOUR BOAT. THEY CREATE SMALL SCRATCH MARKS THAT WILL COLLECT MARINE GROWTH AND OTHER FOREIGN MATERIALS.

CABINETS

The handcrafted interior cabinets feature a sprayed clear coat finish. This clear coat produces a hard finish which is baked on and is very resilient. Use a warm solution of water and mild detergent to keep the cabinet surfaces looking new. Wipe the surface with the solution using a soft damp cloth, and dry with a soft clean towel. This procedure should eliminate most stains and oily finger marks.
Stay away from heavy scrubbers and compounds which may harm the surface. Avoid polishes containing silicones.

Use the specifications below as a guide for any cabinet repairs or interior refurbishing needs.

APPLICATION	ADHESIVE
WOOD TO WOOD	WOOD GLUE
WOOD TO FORMICA	CLEAR SILICONE
FORMICA TO FORMICA	CLEAR SILICONE
SINK INSTALL	CLEAR SILICONE
CORIAN TRIM	SIKA FLEX 291
MIRROR TO FORMICA	MIRROR MASTIC
GRANITE TO WOOD	SIKA FLEX 291

CANVAS CLEANING INSTRUCTIONS

Sunbrella type canvas should be cleaned regularly before substances such as dirt, roof particles, etc., are allowed to accumulate on and become embedded in the fabric. The fabric can be cleaned without being removed from the boat. Simply brush off any loose dirt, hose down, and clean with a mild solution of natural soap in lukewarm water. Rinse thoroughly to remove soap. DO NOT USE DETERGENTS! Allow to air dry.

For heavily soiled fabric, remove the top from the frame. Soak the fabric in a solution that has been mixed to the following proportions: 1/2 cup of Clorox bleach and 1/4 cup of Ivory or Lux soap (liquid or soap) per each gallon of lukewarm water. Allow the fabric to soak until the bleach has killed the mildew and the stains can be brushed out with a common kitchen scrub brush. Rinse the fabric thoroughly in cold water to remove all the soap. This may require several rinsings. Incomplete rinsing can cause deterioration of sewing threads and prohibit the fabric from being properly retreated. Allow the fabric to dry completely.

DO NOT STEAM PRESS OR DRY IN AN ELECTRIC OR GAS DRYER!

Excessive heat can damage and shrink the fabric since it is heat sensitive.

This method of cleaning may remove part of the water and stain repellents that was applied to the fabric during its manufacture. It is recommended to retreat with such water repellency products as Apseal and Uniseal. We do not recommend any wax based treatments such as Thompson's Water Seal or any of the silicone products such as SC-15 or Aqua-Tite. Wax based products prevent the fabric from breathing, and encourage mildew growth while the silicone products interact with the original fluorocarbon finish and seem to cause a rapid loss of water repellency. Scotchguard has not been found to be very effective for restoring water repellents to Sunbrella. It seems to work well in the short run, but not long term.

CLEAR VINYL, ZIPPER & SNAP CARE

Never store canvas wet or in an unventilated, moist area. Always roll the canvas instead of folding. This is of particular importance on side curtains or any other part with the clear vinyl "glass". Roll the top carefully around the bows and cover with the storage boot provided.

The clear vinyl "glass" used in side curtains, aft curtains, visors, and camper enclosures is very susceptible to heat and cold. Keep vinyl curtains from touching metal tubing to minimize burning the vinyl.

If the boat is stored with top, side curtains and aft curtain in place, heat build up inside the boat may discolor the vinyl.

To clean the clear "vinyl" glass, use a solution of Ivory or Lux soap, liquid or flakes, and lukewarm water. Allow to air dry. Never use any type of abrasive cleaner as it will scratch the "vinyl" glass. There are many cleaners and scratch removers on the market specifically for clear vinyl. Handle the clear curtains carefully. They are soft and prone to scratching.

Canvas parts are designed with zippers. When zippers are new they can be a little difficult to use. Zip carefully without forcing the zipper or the material. They will loosen with use. A zipper lubricant may be used to help new zippers as well as maintaining used ones. The most vulnerable part of the zipper is the starts. Use care when starting the zipper.

Canvas snap fasteners should be unsnapped as close to the button as possible. Never remove canvas by pulling roughly on the edge of the material. This can damage the canvas as well as the fasteners. Use petroleum jelly on snaps to keep them from developing corrosion especially in harsh environments.

CARPET-INTERIOR

The interior cabin carpet is produced from 100% BCF nylon. The nylon is treated tropically with an anti-soil chemical that will assist in keeping your carpet looking beautiful longer.

General Care and Maintenance

Your carpet is a high luster nylon that can look great for years to come provided you follow some basic care and maintenance. Nylon is the highest performing synthetic fiber in the market and has dense pile that will give a long wear cycle and high performance.
The following will help maintain your carpet:

Regular Vacuuming

This is the most important single factor in keeping carpet beautiful is to vacuum it on a regular basis. Sand and dirt particles will abrade the carpet fibers in a faster manner. This abrasion will cause non-repairable damage to the fiber that will reduce the carpet's life expectancy. Use a vacuum with a beater bar verses a vacuum alone as it will lift the fiber and help open the carpet to allow the vacuum to remove grit.

Professsional Cleaning

Interior carpet is the same as high-end residential carpet and the carpet should be treated accordingly. Periodic professional carpet cleaning using either the hot water extraction or dry cleaning powder method will help manintain the beauty of your carpet. This will remove the ground in soil.

Spills

At some point in the life of the carpet, there is always the potential for a spill. Remove the spill immediately. The quicker the spill is removed, the easier it is to clean up. The longer a spill stays on the carpet, the more likely it is to stain the fibers, regardless of the cleaning treatment used. When a spill occurs, always blot the area being cleaned. Do not rub or scrub. Follow the cleaning instructions.

Cabin Door/Cockpit Entrance Mats

Entrance mats on a boat are very important to help reduce the dirt and sand that is brought on to the carpet. Also, entrance mats reduce the amount of moisture being tracked on to the carpet, which will cause matting of the fibers.
Mats can be ordered from your Regal dealer. These mats fit the nautical decor and provide the best surface to catch dirt and sand particles. Also, entrance mats can be obtained from local sources. Look for mats with a non-skid backing.

CARPET-COCKPIT

Regal cockpit carpets feature an *aqua tread* backing which permits the carpet to weep moisture and still retain steadfast non-slip characteristics. Also, this backing permits the cockpit carpet to lay flat on the fiberglass deck surface without buckling.
Also, your cockpit carpet is produced with 100% ultraviolet resistant fibers. The carpet boasts a special blend of resilient fibers to withstand traffic and retain its beauty.
Cockpit carpet is designed to take a lot of abuse from the sun and sea but it periodically needs to be cleaned which is a different procedure from household types.

To clean cockpit carpet follow these steps:

1. Scrub the soiled areas with a stiff nylon or soft bristle brush to loosen the dirt and grime.

2. Vacuum the carpet thoroughly using a wet-dry type of cleaner.

3. Pour one cup white vinegar into a 1-quart spray bottle; fill with water.

4. Spray the soiled areas with the vinegar solution until saturated; let stand 15 minutes.

5. Brush the soiled areas once more; the dirt and grime will be released from the carpet fibers.

6. Rinse the carpet, with a garden hose at low pressure.

7. Remove any remaining water with a wet-dry vacuum. Allow the carpet to dry completely.

8. Fluff up the clean, dry carpet with the brush or a carpet rake. If applicable, apply vaseline to the snaps.

Stain Removal

Olefin fiber used in the cockpit carpet is very resistant to stain. However, when a stain does occur, follow the stain removal chart on the following page. Remember, remove a stain as soon as possible, as this enhances the ability to remove it.
Most stains should easily be removed from olefin fibers. If the stain persists, the cleaning procedure should be repeated to ensure stain removal. Again, the sooner the stain removal process is started, the easier the stain will be to remove.
Under no circumstances should any solvents normally associated with the dry cleaning of apparel (perchlorethylene, carbon tetrachloride, etc,) be utilized, as permanent damage to the fiber will result.

To store cockpit carpet, roll it tightly. This will keep the carpet from developing wrinkles which result from folding the carpet.

Cockpit Carpet Stain Removal Chart

Miscellaneous Stains	**Removal Process**
Coffee, Tea, Coke, Fruit Juice, Ice Cream, Motor Oil, Egg, Grease, Catsup, Chocolate, Milk, Rust, Latex Paint, Water Colors, Berry Stains, Blood, Salad Dressing, Furniture Polish, Clay, Wine, Dye, Mayonnaise, Fish Formula or Urine	Apply warm water and household detergent in minimal amounts to the stained area. Sponge or scrape the stain until it is removed. Then wash thoroughly with clean water.
Persistant Stains	Removal Process
Chewing Gum, Crayon, Ink, Wax, Lipstick, Tar, Polish, Oil Paint	Apply warm water and household detergent. Work mixture well into the stained area, and then flush with warm water.

SOLID SURFACE COUNTERTOPS

Regal feaatures solid surface countertops because of their elegance and durability. Periodic maintenance will ensure their beauty. The product consists of an all-acrylic material which is longer longer lasting when compared to other laminate surfaces.
The product offers striking color choices with sharp particulates. This creates patterns that leap off the galley, head, and other surfaces. It provides a remarkable depth and translucent effect throughout the entire surface.

Care & Maintenance-

General cleaning of of our solid surface countertops is accomplished by wiping the surface with a damp cloth or sponge, then dry with a soft cloth or paper towel to prevent spotting, especially where hard water is present.
Clean with an ammonia-based product such as a household glass cleaner or commercially available non abrasive spray-on cleaner for solid surface products. Wipe down with a paper towel or soft terry cloth to prevent spotting.
Dark colors will eventually show signs of use such as scratches and soap residue.
A gloss surface usually requires periodic maintenance and care to sustain its original luster.
Do not attempt to remove deep scratches, chips or burns.

DO NOT USE ABRASIVE CLEANSERS AND PADS OF ANY TYPE ON THE GLOSS FINISH!

Spray a non-abrasive product such as Formula 409 over the stain and wait a couple of minutes. Then scrub in a small circular motion with a wet sponge. Scrubbing too aggressively may actually reduce the gloss level.

After completing the above process, rinse with clear water and wipe dry with cloth or paper towels to avoid spotting. To enhance the visual color clarity, and hide minor scuffs, apply Countertop Magic cleanser and wipe away excess with a soft cloth.

Heat- Solid surface materials exhibit excellent heat resistance properties than other comparable countertop materials. However, placing hot pans, as well as certain heat gathering appliances such as electric grills or deep fryers, can damage the surface. Always use a hot pad or trivit with rubber feet to protect countertop surfaces. Avoid subjecting surfaces to extreme hot temperatures.

Chemicals- Avoid exposing countertop surfaces to strong chemicals such as paint removers, acetone, and oven cleaners. Surfaces exposed to these chemicals should be promptly flushed with water; contact may cause spots that may require extensive repairs. Remove nail polish with a non-acetone based nail polish remover and flush with water.

Scratches- Never cut or chop directly on a solid surface countertop. Always use a cutting/chopping board with rubber anti-skid feet.

Fractures- Avoid standing on countertops or dropping heavy objects on the surface.

ELECTRIC BBQ

STAINLESS STEEL SURFACES

The best way to clean metal surfaces on your BBQ is to wipe them down wih a damp cloth and then thoroughly dry. Stubborn spots caused by spillage and discoloration from heat may be removed by lemon juice, vinegar, or chrome polish. Keep these cleaning products away from porcelain enamel surfaces. Never use coarse cleaners, steel wool scouring pads or metal brushes to clean stainless steel. These methods will allow deep scratches to develop on the stainless steel that cannot be removed.

PORCELAIN ENAMEL

Porcelain enamel is glass fused on steel at very high temperatures. It is not overly delicate but must be treated like glass. Sharp blows, radical changes in temperatures, etc; will cause the enamel to crack or chip. Some foods contain acids which will dull the finish of the enamel.

FABRICS-INTERIOR

Clean flat good interior fabrics with dry cleaning fluid style cleaners approved for use with soft fabrics. Allow adequate ventilation and follow the label instructions carefully. Use protective eye wear and gloves. Do not inhale the chemicals.

Use a soft cleanser with feldspar to clean stubborn marks or stains on wallpaper.

Normal interior vinyl such as the headliner need a mild soap and water solution. Rinse immediately with clean water and wipe dry. Always test a small area with a cleaner before applying it to a larger area.

FIBERGLASS & GELCOAT

⚠ CAUTION

AVOID BODILY INJURY!
WAXED GELCOAT SURFACES CAN BE VERY SLIPPERY. DO NOT WAX NORMALLY USED AREAS OF THE DECK, LINER, OR GUNWHALES. DO NOT WAX ANY TEXTURED OR NON-SKID SURFACES SUCH AS FLOORS, WALKWAYS, STEPS, LADDERS OR SWIM PLATFORMS.
ALWAYS WEAR NON-SLIP FOOTWEAR WHILE ON BOARD THE VESSEL.

Routine maintenance is the only practical way to keep the surface of your boat looking shiny and new. Most objects left outdoors will gradually deteriorate from exposure to the sun, water, dust and pollution. Such outdoor exposure can cause your boat's gelcoated surface to change or fade. Darker colors tend to fade more rapidly than lighter colors because they absorb more of the sun's rays (ultraviolet and infrared).

Basic maintenance includes monthly washing of the boat's surface to remove normal accumulation of soil and stain. Use a mild detergent such as dishwasher powder or liquid. Do not use automatic dishwasher detergent. Avoid any kind of alkaline cleaners such as tri-sodium phosphate (TSP), abrasives, bleaches and ammonia. For best results use cleaners that are recommended for fiberglass.

It is recommended that you wax the gelcoat surface twice yearly to prevent loss of gloss and to protect the finish. Use only waxes for fiberglass and follow the label instructions. Apply a 3' x 3' section at a time using clean applicator cloths or a buffing bonnet. When a haze develops, use a power buffer at low speeds (1200-2000 rpm) to remove the haze. Keep the buffer moving to avoid heat build-up. Never wax gelcoat in direct sun.

When the washing and waxing as recommended does not restore the shine it may be necessary to use a fine rubbing compound. Do not apply rubbing compound in direct sunlight. A power buffer at lower speeds does an excellent job to remove impurities from the gel coat that cause dulling. Use light pressure and keep the buffer moving. Re-wax after compounding to buff the surface.

"Hairline cracks" or "spider webbing" could develop in the gelcoat surface of a hull or deck. This can be caused by impact or other factors. Small air pockets or gouges may also occur through normal **wear.** These do not affect the strength of the hull or deck and can be repaired by yourself, a marine professional or a Regal dealer.

The affected area should be chipped or sanded away and a thin layer of color matched gelcoat applied. This layer is then sanded smooth and buffed to its original luster.

Most minor scratches, nicks, and dents can be removed by compounding the surface. Marine type compounds can be found at most auto body supply stores.

Specify a number 25 which is a coarser compound up to a number 55 being less coarse. Various glazes and polishes are available as needed. Ask your marine professional or Regal dealer for more information. Fiberglass hulls are strong but they can be damaged. A fiberglass hull has virtually no internal stresses. Thus when a part is broken or punctured, the rest of the hull retains its original shape. A severe blow will either be absorbed or result in a definite localized break. A break of this nature should be checked and repaired by a marine professional or a Regal dealer.

MINOR REPAIRS

You will need the following materials for minor repairs:

- Gelcoat
- Clear Liquid Catalyst
- Putty Knife
- Razor Blade
- Fine Sandpaper (400,600,1000)
- Wax Paper (to cover repair area)

⚠ WARNING

AVOID BODILY INJURY!
GELCOAT & FIBERGLASS RESIN
ARE FLAMMABLE.
WORK IN A WELL VENTILATED AREA
FREE FROM OPEN FLAMES.
DO NOT SMOKE!

For minor repairs refer to the following procedure:

1. Clean the area to be repaired and get rid of any wax or grease residues.

2. Clean out scratches, chips, and nicks.

3. Sand area to be repaired so gelcoat will bond.

4. In a separate container, measure only the amount of gelcoat you will need. Mix a ratio of 2% ratio of catalyst to the amount of gelcoat being used (a spoonful of gelcoat will require only a drop or two of catalyst). Do not pour any unused portions of the gelcoat/catalyst mixture back into either original container.

5. Apply gelcoat to area leaving a slight lift above the surface.

6. Cover the area with wax paper. It will help the mixture to set up faster.

7. Remove wax paper and shave off any extra gelcoat with a razor blade.

8. After the area is shaved smooth, start with the 400, 600, and finally 1000 grit sand papers.

9. Buff the area with compound, polish and a finish wax. You may notice a difference between the repaired area and the original finish due to the natural weathering process.

FLOORS-HARDWOOD

Typical Hardwood Floor

Your Regal boat may have hardwood floors highlighting the interior. Your flooring was chosen because of its beauty, durability and care-free maintenance. Several types have or are being used including light maple, walnut, cherry, cherry-holly, and bamboo.

Here are some do's and don'ts to follow in keeping your boat's flooring like new:

First, do remember that if you have been cleaning residential floors with vinegar and water, oil soap, furniture polish or window cleaner, you may be ruining your costly investment. These cleaners are a big no with hardwood floors.

Excessive wet mopping with water and vinegar can cause wood to expand, possibly permanently damaging the floor in addition to dulling the finish. Other cleaners that have silicone, wax or oil soaps can leave a residue on the finish and may cause the floor to be slippery which is what you do not need with a boat.

One residue-free, proven hardwood floor cleaner formulated specifically for polyurethane-finished hardwood floors is BonaKemi's Swedish Formula® Hardwood Floor Cleaner. This environmentally friendly, non-toxic, ph-neutral cleaner effectively cleans dirt, grease and sticky spills without leaving any dulling residue. Apply per container directions.

Preventative care of your floors is also exteremely important for keeping hardwood floors looking like new. Vacuuming or sweeping floors regularly, promptly removing spills, and placing mats at cabin door and cabin stairway landing can be effective in trapping damaging sand and dirt particles before they can damage the floor. Avoid walking on floors with high heel shoes. Walking or tennis shoes with soft soles are better and safer to help prevent falls while on the vessel. The harder heels especially black ones tend to leave scuff marks on the floor surface. It is a good idea to keep the nails of pets trimmed, too.

Note: Use a soft application pad inserted in a long handle to apply product. Rinse often in a clean bucket with warm water which are available at most "box" stores.

GAUGES/SWITCH PANELS

For normal dirt and dust accumulation clean with soft cloth and warm water. Dry with a soft cloth or chamois.
Near salt water environments deposits can build up on the instrument bezels and faces. Use a soft damp cloth to remove the deposits. Do not use abrasives or rough, dirty cloths to wipe instruments.
Follow the same procedure for all switch panels. Do not use any of the following on panels:

1. Lacquer Thinner
2. Dry Cleaning Fluid
3. Acetone
4. Carbon Tetrachloride
5. Benzine
6. Silicone Spray
7. Gasoline

Sometimes gauges develop condensation inside their faces. in high humidity environments. To eliminate the condensation droplets, energize the instrument lighting and the heat over a short period of time This process will evaporate the gauge condensation.

HULL/DECK

HULL BOTTOM

Never use wire brushes or highly abrasive scouring pads on your hull bottom. It could damage the gelcoat surface or the bottom paint. The bottom of your boat needs to be clean since the build up of natural coatings from water or marine life can potentially create drag and affect boat performance. Use a turkish towel or for heavier build-up a piece of rug to clean the bottom.

HULL/DECK

For normal dirt and insect residue find a soft bristle brush on a long telescopic handle at an automotive store. A good brush is designed with a curved soft base to protect objects it comes in contact with while scrubbing. Rinse down the hull with a hose to loosen up the dirt. Use a mild soap solution in a bucket. Use up and down strokes to clean the hull sides. Rinse off until all residue is removed.

CAUTION

AVOID BODILY INJURY!
GELCOAT SURFACES CAN BE VERY SLIPPERY.
ALWAYS WEAR NON-SLIP FOOTWEAR WHILE ON BOARD THE VESSEL.
ALWAYS RINSE SURFACES ADEQUATELY TO AVOID SLIPPING ON SOAPY SURFACES!

MICROWAVE OVEN

1. Turn off the oven.
2. Keep the inside of the microwave clean. When food splatters or spilled liquids adhere to oven walls, wipe with a damp cloth. A mild detergent may be used on extremely dirty surfaces. Avoid the use of sprays and other harsh cleaners as they may stain, streak, or dull the door surface.
3. The outside surfaces should be wiped with a damp cloth. To prevent damage to the operating parts inside the oven, water must not enter the ventilation openings.
4. Wipe the door and window on both sides, along with the door seals and related parts frequently with a damp cloth to remove any spills and splatters. Do not use any abrasive cleaner.
5. Do not allow the control panel to become wet. Clean with a damp cloth. When cleaning the control panel leave oven door open to prevent the oven from accidentially turning on.
6. If steam accumulates inside or outside of the oven door, wipe with a soft cloth. This may occur when the microwave is used in high humidity conditions and this is normal.
7. It is occassionally necessary to remove the glass tray for cleaning. Wash the tray in warm sudsy water or in a dishwasher.
8. Remove odors from your oven by combining a cup of water with the juice and skin of one lemon in a deep microwaveable bowl, microwave for 5 minutes. Wipe thoroughly and dry with a soft cloth.

PLASTICS

There are different types of plastic aboard your vessel. Use plastic cleaners and polishes recommended for marine use only. Use proper applicators. Read all instructions carefully. Test the product in a small area first. Use a soft rag and always rinse the surface with water. Ammonia based cleaners will damage plastic parts.

One of the basic rules to cleaning plastic is never use abrasive cleaning products. Even hard plastic surfaces are easily scratched. Stay away from steel wool pads, powdered cleaners with abrasive qualities, or harsh detergents.

Instead use sponges, soft cloths, and mild detergents when cleaning plastic.

While cleaners in aerosol cans are convenient they may not be the best for certain types of plastic. Glass cleaner in a can or a spray bottle is not safe to use on your marine toilet fixture or toilet seat. Many times pits will develop over time and the toilet/seat will appear mottled and will not appear clean no matter how hard you scrub.

Refer to a marine store which possesses the expertise and experience to assist the boat owner in selecting the right cleaner for his marine plastic onboard needs.

NOTICE

NEVER CLEAN PLASTIC SURFACES WITH A DRY CLOTH OR GLASS CLEANING SOLUTIONS CONTAINING AMMONIA. NEVER USE SOLVENTS OR WIPE WITH ABRASIVES.

RANGE/STOVE

Clean the cook top before you use it for the first time. A thorough cleaning with a recommended product such as Cerama-Brite Cook Top Cleaner will put a clean shiny coating on the cook top before its initial use.

Always remove food spills, grease splatters, and metal rub-off from utensils. First, use a razor blade scraper to remove all spillovers. Then clean the cook top with a paper towel or a clean soft cloth and a recommended cleaner. After using any cleaner always wipe the cook top with a clean, damp cloth (to avoid burned-on cleanser residue) and wipe dry.

Do not use your dish towel or sponge to wipe off the cook top. This may leave a film of detergent of other matter that can cause discoloration the next time the cook top is heated.

Avoid abrasive scouring powders of any kind. Also, avoid using plastic, nylon or metal cleaning pads. They may scratch or melt onto the cook top. Avoid chemical cleaners such as chlorine bleach, ammonia, hydrofluoric acid or chemical oven cleaners. They may etch or discolor the surface.

Do not let anything that melts such as plastics, aluminum foil, or sugar to come in contact with your cook top surface when it is hot. Should something melt onto the surface, immediately move it to a cool area of your cook top with a razor blade scraper, and then remove it from the cook top as soon as possible

Note: In an emergency install the stove top over the stove. This will cause the switch to deactivate burner power.

SPOTLIGHT

The spotlight lens should be wiped with a clean, dry soft cloth to remove any debris such as bugs, salt spray or general dirt. Read the manufacturer's literature for more information.

STAINLESS STEEL

Stainless steel is an alloy made from nickel, chromium and iron. It has been very successful in marine environments due to its ability to resist rusting. If the stainless steel product such as a bow rail is exposed to elements such as ocean spray it will begin to rust over time.
If your stainless steel shows signs of rusting:

1. Wash with fresh water.

2. Clean with a good quality chrome polish periodically but no less than annually. "Brasso" is another product that works well.

3. Also, using a good quality car wax will provide extra stainless steel protection.

4. For polished finishes that show grit lines an abrasive such as "Scotch Brite" or sand paper can be used. Always test a spot first and "go with the grain".

Do not use harsh solvents or cleaners on stainless steel.
Do not use steel wool or wire brushes. They will damage the finish.
Do not use any type of acids.

STAINS

Below is a listing of normal stains and clean-up methods. The sooner the stain is removed there is less chance of permanent residue on the surface.
Do not use wire brushes, solvents or harsh chemicals on any stain. Damage to the surface will occur.

FREQUENT STAINS	CLEAN-UP STEPS		
	1	2	3
Coffee, Tea, Chocolate.....	B		
Permanent Marker*.....	E	B	C
Household Dirt.....	A	B	
Grease.....	D	B	
Ketchup, Tomato Products.....	A	B	
Latex Paint.....	A	B	
Oil Base Paint.....	D	B	
Mustard.....	A	B	C
Suntan Oil.....	A	B	
Asphalt/Road Tar.....	D	B	
Crayon.....	D	B	
Engine Oil.....	B		
Spray Paint.....	B		
Chewing Gum.....	D	A	
Shoe Polish*.....	D	B	
Ballpoint Pen*.....	E	B	A
Lipstick.....	A	B	
Eye Shadow.....	E	B	
Mildew*.....	C	B	A
Wet Leaves *.....	C	B	A

A= Soft brush; warm soapy water/rinse/ dry
B= Fantastik cleaner
C= One tablespoon ammonia, 1/4 cup of hydrogen peroxide, 3/4 cup of warm water/ rinse/dry
D= Scrape off residue (use ice to lift gum)
E= Denatured alcohol/rinse/dry
* These products contain dyes which leave permanent stains.

UPHOLSTERY

Cockpit vinyl requires periodic cleaning to maintain a neat appearance and to prevent the build up of dirt and contaminants that may stain and reduce the vinyl life if they are not removed. The frequency of cleaning depends on the amount of use and conditions to which the vinyl is subjected.

Most common stains can be cleaned using warm, soapy water and clear rinses. Scrubbing with a soft bristle brush will help loosen soiled material from embossed surfaces and under welting. If the stains are not removed with the above method use a mild cleaner such as Fantastic. This cleaner should be used only as needed and not the normal means.

With more stubborn stains, rubbing alcohol or mineral spirits may be tried cautiously. Widespread solvent use can severely damage or discolor vinyl.

Try to remove stains immediately before they have a chance to penetrate the surface of the vinyl.

Powdered abrasives, steel wool, or industrial strength cleaners are not recommended for cleaning our vinyl. Lacquer solvents will cause immediate damage. Dilute chlorine bleach before using. Do not wax the vinyl as it may cause cracking. Always wear protective gloves and make sure there is sufficient ventilation when cleaning vinyl. Wear eye protection.

Remember that suntan oil will damage vinyl. Use suntan lotion instead of suntan oil. Exposure to the sun is a natural enemy of vinyl upholstery. For maximum life, use a cockpit cover when the vessel is moored, docked or stored.

Ultra Leather- interior vinyl that may of been featured in the salon sofa, salon seating arrangements, and both aft and forward berths. It can be identified for its softer leather touch over a firmer cockpit vinyl.

Contact your closest yacht dealer for more detailed information regarding the upholstery used on your hull number.

Clean Ultra Leather by following the information below.

1. Remove the stain immediately.
2. Spot clean with mild soap and water.
3. Air dry or dry quickly with warm setting of a hair dryer.
4. For stubborn stains, use mild solvent.
5. For tougher stains Fantastik® and Formula 409® brand spray cleaner have been shown to be successful.
6. Disinfect with a 5:1 beach solution.

For the following stains, a mild detergent may be used. Blot or wipe stains immediately.

A. Ketchup, Mayonnaise
B. Butter
C. Red Wine, Liquor
D. Coffee, Tea, Coca-Cola®
E. Make-Up, Face Cream, Lipstick
F. Machine Oil
G. Urine, Blood
H. Steak Sauce, Soy Sauce
I. Chocolate
J. Milk

Ballpoint Pen Removal Instructions

1. Wipe the stain off with ethanol (rubbing alcohol).
2. Prepare a solution of 50% non-chlorinated bleach, 50% water.
3. Place a thin line of tissue over the ink stain.
4. Apply the non-chlorinated bleach solution to the tissue. Be sure not to saturate the tissue.
5. Cover tissue with polyethylene film (plastic wrap) to prevent the non-chlorinated bleach solution from drying.
6. Check on stain repeatedly.
7. Do not leave the non-chlorinated beach solution on for more than 1 hour.
When the stain looks almost gone, remove the tissue and wash the stain with water.
9. To neutralize the bleached area, place tissues on the bleached area and apply 15% hydrogen peroxide solution.
10. Leave on for 30 minutes, & then remove the tissues.
11. Remove the peroxide residue with water.

MAINTENANCE

This section covers maintenance procedures on selected standard and optional Regal installed and/or related equipment. *Engine and propulsion equipment, electronic and specific entertainment components are found by referring to individual vendor information located in the owner's information packet.*
The engine/propulsion and generator owner's manual are quite detailed and should be read and understood before attempting to undertake any maintenance issues.

Heed special attention to all caution, warning and danger labels found in the engine/propulsion and generator manual.

Also, the major electronic and entertainment components are outfitted with detailed system descriptions, wiring schematics, and contact information. The internet can be helpful for select maintenance issues. Numerous web-sites are currently available from vendors on their particular product maintenance procedures and schedules.

AIR CONDITIONER:

Before each outing inspect the thru-hull fitting for leaks. Make sure the seacock is open. Also, the sea water strainers located under the engine room center walk-thru should be checked periodically for foreign objects and accumulated debris. To clean the strainer, first position the seacock handle to the "off" position. Unscrew the strainer fasteners by turning counterclockwise, remove the wire strainer, and blow it out if possible with compressed air. Reinstall the strainer, make sure the gasket on the top of the seacock is centered, and tighten the fasteners. Check for leaks since sucking air into the system could cause the seawater pump to malfunction. See the illustration.

Inspect the air filter monthly. The air conditioner filter is located at the condensation unit at both forward and aft A/C units. To clean the filter remove it and rinse with plenty of fresh water. Blow with compressed air as needed.

Check the AC hose output located on the hull side insuring there is a full discharge when the AC pump is running. If there is little or no discharge shut down the unit and immediately find the cause of the problem.

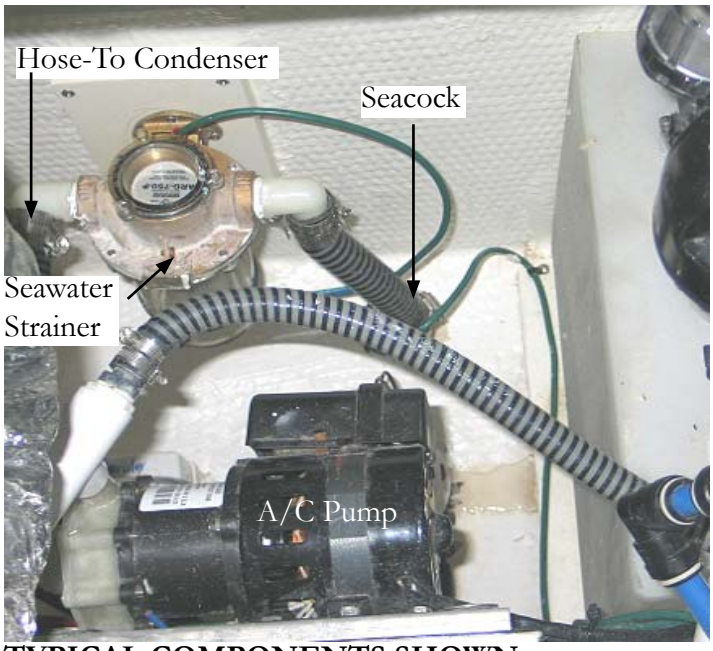
Periodically check the drain located at the compressor to make sure the entrance to the hose at the AC pan is not clogged with foreign matter.

If clogging occurs, blow out the hose with compressed air and pour in a bleach/water solution at 5/1 parts water to bleach.

Be sure to read and understand the A/C owner's manual before attempting any maintenance. It covers the operating system and equipment more thoroughly than can be done here. Pay close attention to all safety labels since both high pressure and high voltage are part of the A/C system.

WARNING

TO PREVENT BODILY INJURY OR DEATH! DUE TO THE HIGHLY PRESSURIZED REFRIGERANT FOUND IN THE AIR CONDITIONER UNIT, DO NOT LOOSEN OR REMOVE ANY FITTINGS.



TYPICAL COMPONENTS SHOWN

WARNING

TO PREVENT BODILY INJURY OR DEATH! DISCONNECT THE A/C BREAKER AT THE MAIN A/C PANEL BEFORE OPENING ANY COVER ON THE A/C UNIT.

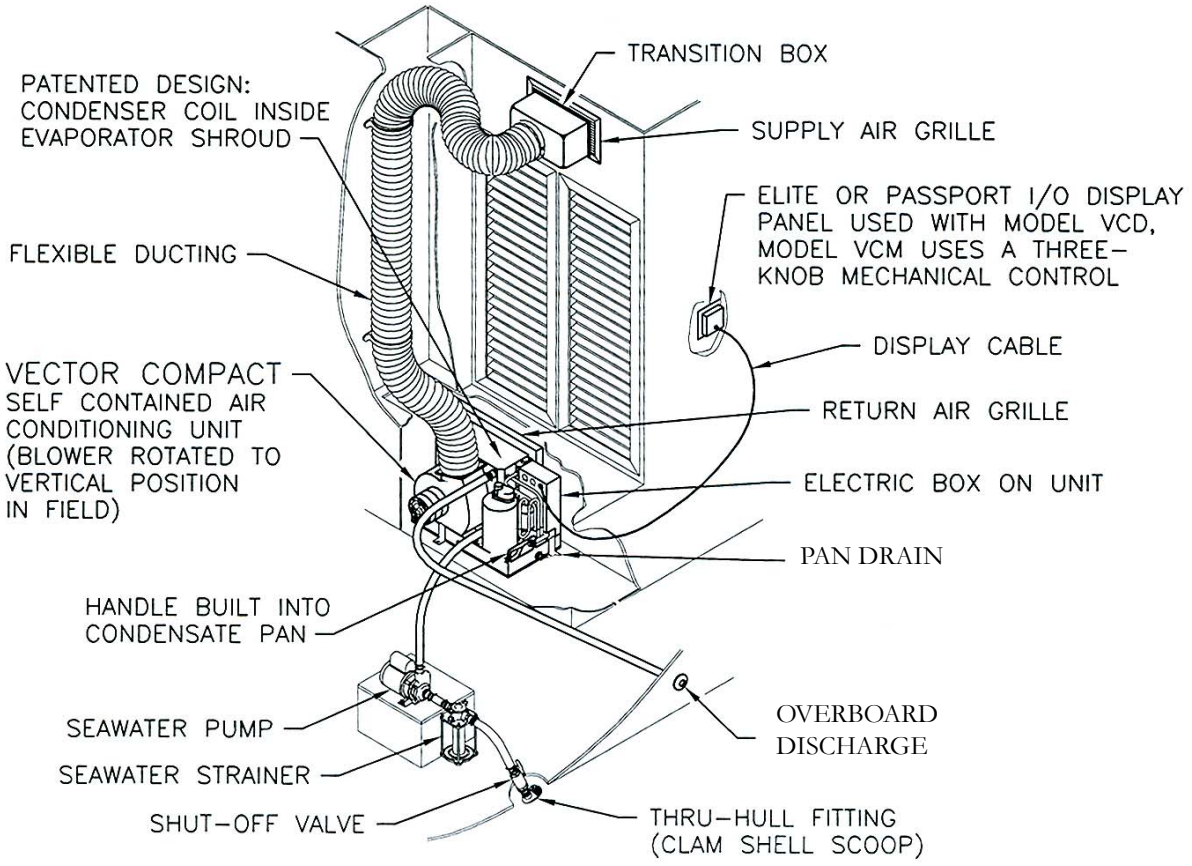
REVERSING VALVES

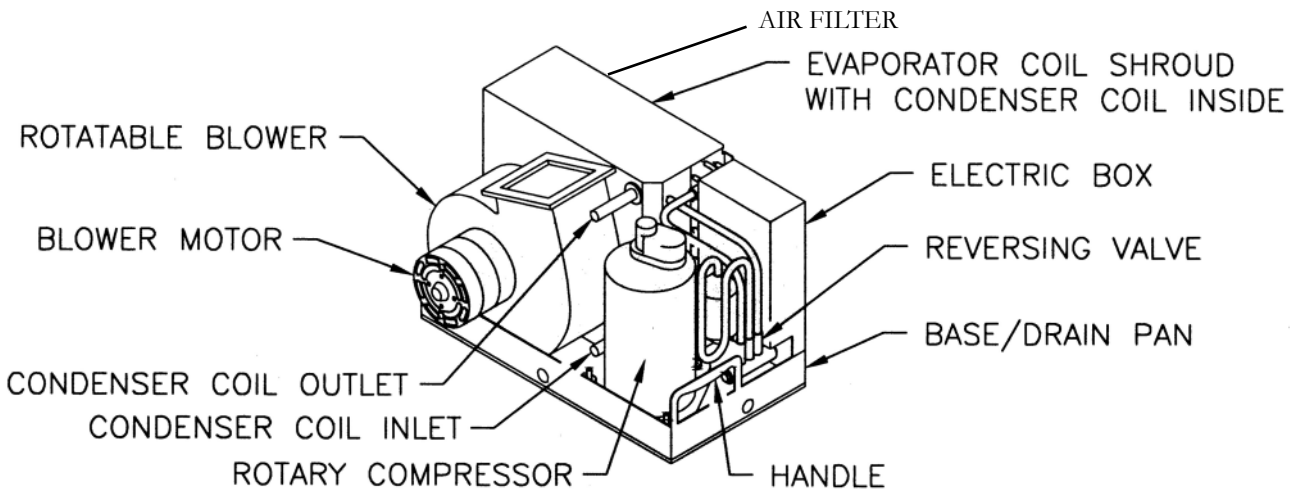
All reverse cycle units use a reversing valve: the valve must be energized periodically to keep the internal parts moving freely. To do this, switch the AC unit into heat for a few seconds once a month.

SEAWATER STRAINER

Check the AC pump for proper seawater flow by cleaning the seacock strainer basket. Check the overboard discharge for proper water flow. Check seawater intake speed scoop for obstructions. Make sure hoses are not looped, kinked or crushed.

TYPICAL VECTOR COMPACT AC SYSTEM





CONDENSER COIL CLEANING

Note: It is best to get an air conditioning expert familiar with marine a/c to do the periodic maintenance mentioned below. The information will assist the technician.

1. With the system turned off at the ship's AC electrical panel, disconnect the inlet and outlet connections of the condenser coil.

2. Use chemical resistant hoses (MAS white PVC 5/8" I.D., etc.) to connect the inlet of the condenser coil to the outlet of a chemical resistant, submersible pump (MAS P-500 pump, etc.) and let the hose connected to the coil outlet flow freely into the container mentioned below.

3. Place a strainer or piece of screen over the inlet of the pump and submerse the pump into a container filled with a 5% solution of muriatic or hydrochloric acid and fresh water or use a premixed over-the-counter solution. Use as large a container as possible to hold the solution (2 to 5 gallons).

⚠ CAUTION

AVOID BODILY INJURY!
AVOID SPILLING OR SPLASHING THE SOLUTION.
FOLLOW THE WARNINGS AND RECOMMENDATIONS GIVEN BY THE MANUFACTURER OF ANY ACIDS OR PREMIXED SOLUTIONS.

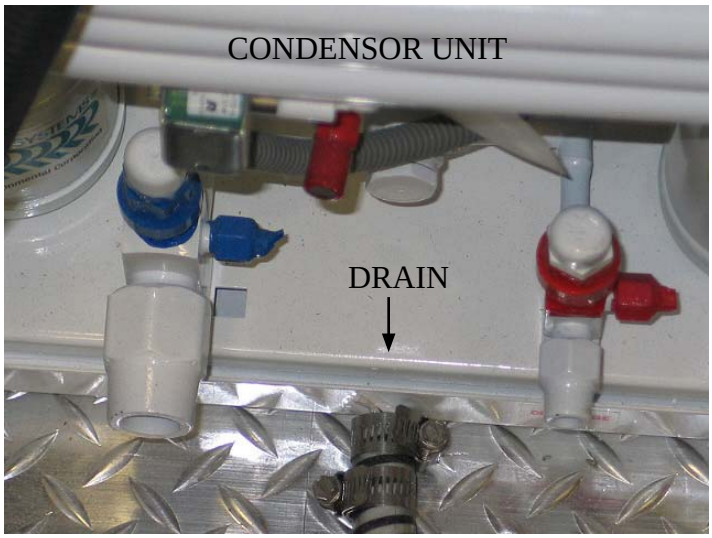
4. Power the pump and circulate the solution through the condensor coil for 15-45 minutes depending on the size of the coils and the extent of the contamination. Visual inspection of the solution in the container should indicate when the contamination removal has stopped.

5. Circulate fresh water through the coil to flush any residual acid from the system.

6. Restart the system and check operational parameters to ensure thorough cleaning has taken place. Additional cleaning may be necessary with extreme contamination.

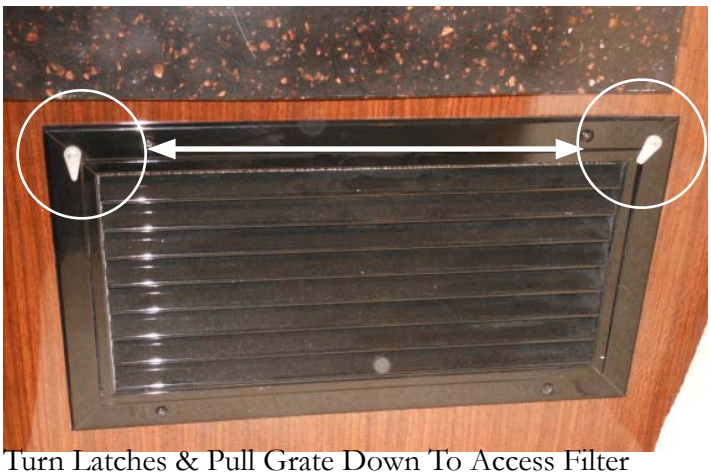
NOTICE

FOR THE PURPOSE OF PROTECTING THE ENVIRONMENT, DISPOSE OF ANY CONTAMINATED ACID SOLUTIONS IN ACCORDANCE WITH FEDERAL, STATE AND/OR LOCAL REGULATIONS



AIR CONDITIONER FILTER

Check the air filter located at A/C condensation unit monthly and clean as necessary. To clean the filter, remove it from the unit by turning the 2 latches so the hinged cover will clear and fall forward. This will allow removal of the air conditioner filter. Rinse with water, air dry and reinstall. Blow with compressed air as needed. See the illustrations below.



Turn Latches & Pull Grate Down To Access Filter

Remove Air Filter To Clean Or Replace

BATTERIES

Periodically check your battery terminals for corrosion build-up. If you find a greenish, powdery substance, remove the cable connections and clean both the terminals and the connectors with a wire brush. When the cleaning is finished reconnect the battery cables and coat the terminals with an approved grease or petroleum jelly to help prevent further corrosion. Check the electrolyte level at least every 30 days, more often in hot weather. The level should be maintained between the top of the battery plates and the bottom of the fill cap opening. Add distilled water as needed after charging the batteries. Do not overfill because sulfuric acid could run over and cause burns or an explosion. Check specific gravity levels with a hydrometer which can be purchased at auto retail stores.

⚠ WARNING

TO PREVENT BODILY INJURY!
WEAR GOGGLES, RUBBER GLOVES
AND A PROTECTIVE APRON
WHEN WORKING WITH A BATTERY.
BATTERY ELECTROLYTE CAUSES SEVERE
EYE DAMAGE AND SKIN BURNS.
IN CASE OF SPILLAGE,
WASH AREA WITH A SOLUTION OF
BAKING SODA AND WATER.

Batteries should be charged outside the boat. Do not smoke or bring flames near a battery that is being or has recently been charged. The hydrogen gas generated by battery charging is highly explosive.

Set the batteries on a block of wood not concrete since the batteries will lose their charge if left on a cement surface.

Do not allow a metal object or loose wires to spark across battery posts while working close to the battery. Contact across terminals will cause a short circuit and possible electrical burns, fire, explosion or personal injury.

Tighten all battery connectors securely. Check their tightness by pulling on the connectors. They should not move from their tightened position. Be sure to reinstall the positive boot over the battery terminal after tightening the battery post connection. While using the boat, keep an eye on the volt meters to monitor the charge level of each battery bank. Monitor the charge with the engines turned off (static condition).

The engine alternators recharge the batteries. A fully charged battery will indicate between 12 and 14 volts on the voltmeter. Readings below this could indicate a dead battery cell or a charging system malfunction which should be checked by a marine professional.

⚠ WARNING

TO PREVENT BODILY INJURY!
BATTERIES CONTAIN SULFURIC ACID
(POISON)
WHICH ALSO CAN CAUSE BURNS.
AVOID CONTACT WITH THE SKIN,
EYES & CLOTHING.
IF CONTACTED, FLUSH WITH WATER AT
LEAST 15 MINUTES. IF SWALLOWED, DRINK
LARGE AMOUNTS OF WATER OR MILK.
FOLLOW UP WITH MILK OF MAGNESIA,
BEATEN EGG OR VEGETABLE OIL. GET
MEDICAL ATTENTION IMMEDIATELY!

BATTERY MAINTENANCE

Maintenance Free Type

The Group 31 "maintenance free" engine cranking batteries are not all together maintenance free. Unlike regular batteries there are no water fill caps to remove on this style battery but several other items need to be monitored periodically.

1. Check both positive and negative terminal hardware for tightness. Loose connections are known to discharge a battery very quickly.

2. Make sure all terminals are clean. If not a battery cleaner tool (available at car parts stores) or old toothbrush should be used to clean both the positive and negative terminals. Use a small amount of baking soda and water. Remove any residue from the terminal area with a disposable damp cloth.
Install corrosion protection to the posts before reinstalling the terminals. Refer to the illustration.

3. After all preventative maintenance is completed slide the red boot back over the positive terminal. This will prevent any object from arcing across the positive terminal to ground possibly causing a fire.

House- (Fill Cap Type)

The single house "deep cycle" house battery located in the blue and white battery box needs periodic maintenance for optimum performance. Remove the cover by turning the 2 white knobs in a counterclockwise direction. Since this type of battery features fill caps each cell's water level can be monitored and distilled water can be added as needed. Follow these maintenance steps for the house battery.

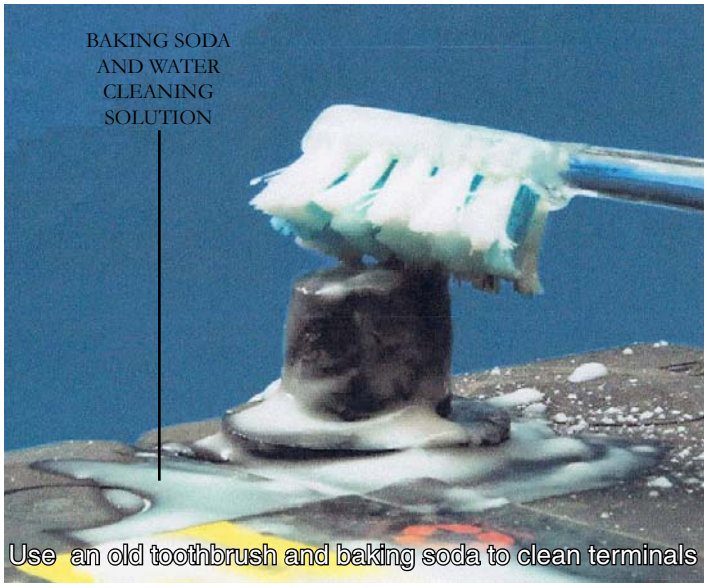
1. The first item to be checked is the open-cell voltage. Use a dedicated battery tester or a voltmeter. With the battery fully charged with no circuits energized the voltage across the terminals should be 12.5 to 12.6 volts.

If the battery is not completely charged, but still adequate to crank the engine over, you may see a reading closer to 12 volts.

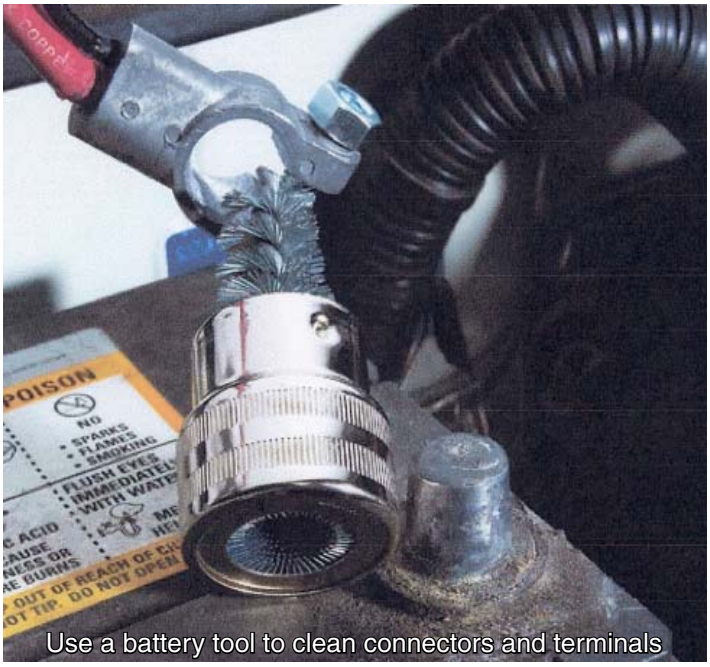
2. If the battery shows less voltage or will not charge up completely it's time to use a hydrometer. This device checks the proportions of sulfuric acid and water in the electrolyte which is a precise indication of the level of charge. Check all cells. If the readings are below 75% charge the battery. If the electrolyte level is too low to read with a hydrometer, add **distilled water only** (tap water will eventually ruin a battery's capacity) to any cells in which the electrolyte isn't touching the bottom of the fill port. **Do not overfill any cells.**
Take another hydrometer reading the following day after the boat has been run and the distilled water has had an opportunity to mix.
If the level of electrolyte is very low, suspect that your yacht's charging system may be generating too high a voltage. The maximum voltage you should see across the battery terminals with the engine running as read by a voltmeter well above idle is 14.6 volts.

3. Check both positive and negative terminal hardware for tightness. Loose connections are known to discharge a battery very quickly.

4. Make sure all terminals are clean. As discussed earlier, a battery cleaner tool along with a toothbrush should be used to clean both the positive and negative terminals. Use a small amount of baking soda and water. Remove any acid residue from the terminal area and battery top with a damp cloth. Be sure to wear plastic gloves and eye protection. See the illustration.
Install anti-corrosion protection to the posts before reinstalling the terminals. This lubricant is available as a paste or spray type and can be found at most marina or auto supply stores.
Be sure to reinstall any red (+) battery (anti-short) boots.



Use an old toothbrush and baking soda to clean terminals



Use a battery tool to clean connectors and terminals

CAUTION

AVOID EYE DAMAGE/SKIN BURNS!
WEAR GOGGLES & RUBBER GLOVES
WHEN WORKING WITH BATTERIES.
AVOID CONTACT WITH SKIN,
CLOTHING OR EYES.
IN CASE OF CONTACT,
FLUSH WITH WATER
FOR AT LEAST 15 MINUTES.
IF SWALLOWED,
DRINK LARGE QUANTITIES
OF WATER OR MILK.
FOLLOW WITH MILK OF MAGNESIA,
BEATEN EGG OR VEGETABLE OIL.
GET MEDICAL ATTENTION IMMEDIATELY.

CAUTION

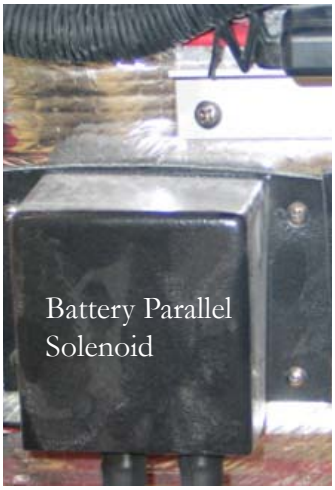
TO PREVENT BATTERY ARCING
FIRST REMOVE THE NEGATIVE BATTERY
CABLE FROM THE BATTERY.

BATTERY PARALLEL SWITCH

If the battery parallel switch fails to operate, check the breaker located above the push button switch. Always find the cause of the problem before resetting the circuit breaker.

A second area to investigate is the battery solenoid located in the engine room. When the switch is pressed the solenoid energizes the appropriate second battery for additional engine cranking capability.

Normally, if you hear a solenoid click it is operating properly. Check all solenoid and battery connections for tightness.

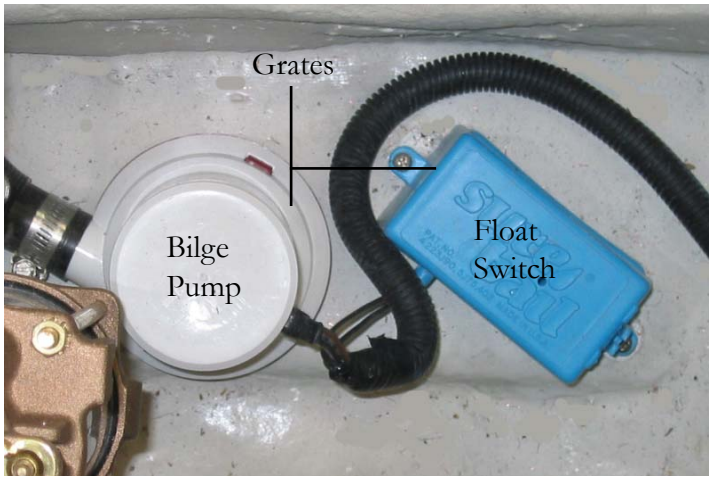


Battery Parallel Solenoid

BATTERY SWITCH PANEL

If the battery switch should lose power to one of the batteries, check the breakers close to that battery switch. Look for a "popped breaker. The above problem could be recognized by the appropriate icon not being lighted at the DC distribution panel. These breakers protect the charging/battery circuitry. Always find the cause of the overload before resetting the circuit breaker.

TYPICAL BILGE PUMP/FLOAT SWITCH



Your vessel offers as standard equipment bilge pump service. Periodically check the grates for debris and test spray the units down with water. Make sure that a steady stream of water exits the through hull fitting indicating the hose from the bilge pump itself is clear.
Periodically check all hoses, clamps and electrical connections for tightness.

CARBON MONOXIDE DETECTOR

Alarm is 4 beeps every 5 sec with flashing red LED, fault is 1 beep every 30 sec with flashing red LED, and power fail is 1 beep every 30 sec with flashing green LED
POWER
ALARM
DO NOT PAINT
Move to fresh air in case of alarm
CO Sentinel
Carbon Monoxide Alarm
FIREBOY-XINTEX

Use the following procedure **monthly** or when leaving the vessel for extended periods. Normal maintenance should include frequent checking for the green power light glowing with the warning indicator and audible horn off. The detector should be returned to the manufacturer for recertification each year.

CO Sentinel Carbon Monoxide Alarm

TO REMOVE CIRCUIT BOARD FROM BASE PLATE

FOLLOW THESE TWO STEPS:

1. Push "locking pins" outward and lift bottom portion of board toward you.

2. Holding the board with one hand, pull to remove the connector(s).

TO RE-INSTALL: Reverse this procedure.

TO INSTALL CIRCUIT BOARD INTO BASE PLATE, FOLLOW THESE TWO STEPS:

1. Insert top of board (with 45' angles) under holding tabs on base plate.

2. Gently lower bottom until board "snaps" into locking pins.

FIGURE 1

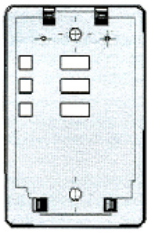
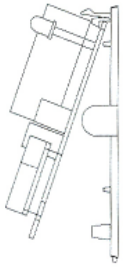


FIGURE 2



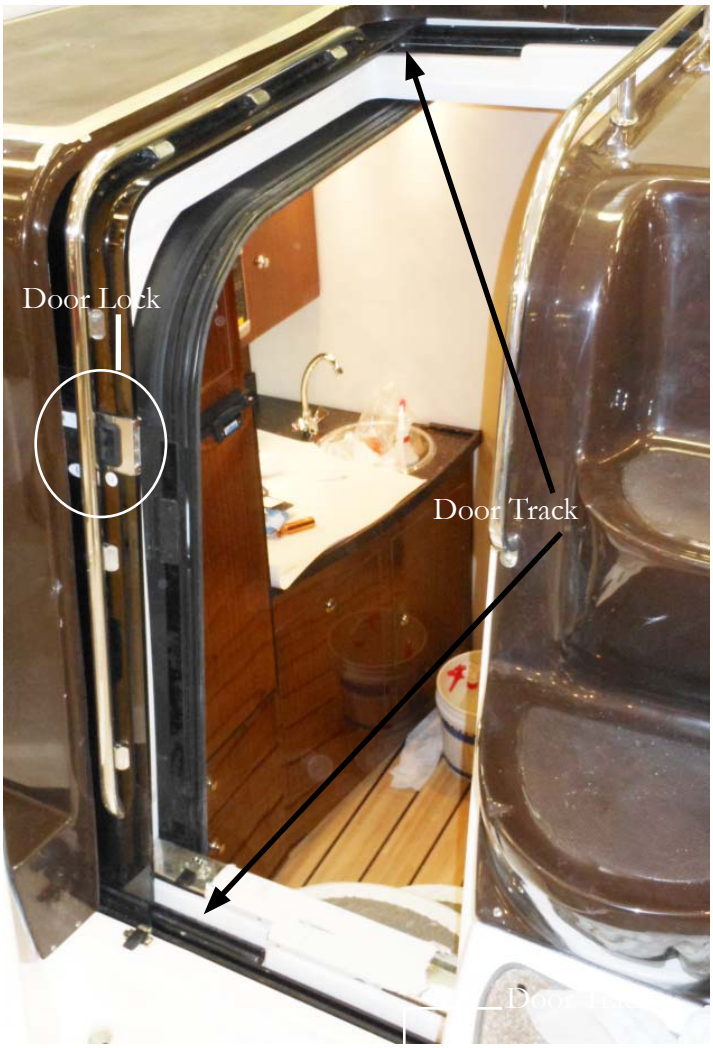
COMPASS

Normally the compass needs no special maintenance unless different equipment has been installed at the helm or existing equipment has been removed. This all effects the magnetic fields in a compass. A qualified compass professional must adjust the compass from the helm station.
Note: do not try to adjust the compass yourself!
Keep the plexiglass dome free from dust and salt deposits by wiping it with a soft damp cloth. A good car paste wax periodically will help protect the instrument from the environment.
When not in use keep the compass protected with a cover.
If the compass becomes erratic, sluggish or there is a lose of liquid it should be serviced by a repair station. See your compass operator's manual.

DOOR-CABIN ENTRY

Periodically clean the lower door tracks since debris can clog the track resulting in a door that may jerk instead of slide to open or close. Use a vacuum or a soft damp cloth.

Lubicate the latch and lock mechanism sparingly with a powdered graphite available at the big box stores. Stick the tube in the key hole and squirt in the graphite. Wipe off any excess with a soft cloth.



ELECTRONICS-

General Maintenance

Since there are no user-serviceable parts on electronic products they should be serviced only by specific marine electronic certified factory technicians.

Some products generate high voltages, and so never handle the cables/connectors when power is being applied to the equipment.

When powered up, all electrical equipment produces electromagnetic fields. These can cause adjacent pieces of equipment to interact with one another, with a consequent adverse effect on operation. In order to minimize these effects and enable you to get the best possible performance from your electronic equipment, guidelines are given in the installation instructions, to enable you to ensure minimum interaction between different items of equipment, i.e. ensure optimum Electromagnetic Compatibility (EMC).

In some installations, it may not be possible to prevent the equipment from being affected by external influences. In general this will not damage the equipment but it can lead to spurious resetting action, or momentarily may result in faulty operation.

Certain atmospheric conditions may cause condensation to form on the instrument window. This will not harm the instrument and can be cleared up by increasing the illumination setting.

Periodically clean any electronic display screens with a soft damp cloth. Do not use any harsh chemicals, solvents or abrasive materials to clean the instrument.

Note: For detailed information on each component refer to your electronics operator's manuals in the owner's information packet. Also, the vendor can be found on-line or phone your closest Regal dealer.

ELECTRONICS-VHF RADIO

If installed the VHF marine radio has been contructed to be virtually maintenance free. With a little attention to a few basic care points, the unit should provide years of service.

1. Although the unit is waterproof by design, keep it as dry as possible. When cleaning the cockpit, never use a direct water nozzle on the unit.

2. Clean the exterior with a soft, non-abrasive cloth.

3. **Do not use any solvents or other chemicals for cleaning the VHF radio.**

4. Periodically inspect the radio case, electrical wiring and antenna for physical damage.

Note: For further information refer to your electronics owner's manuals in the owner's information packet. Also, the vendor can be contacted on-line or phone your closest Regal dealer.

FIRE EXTINGUISHING SYSTEM-AUTOMATIC

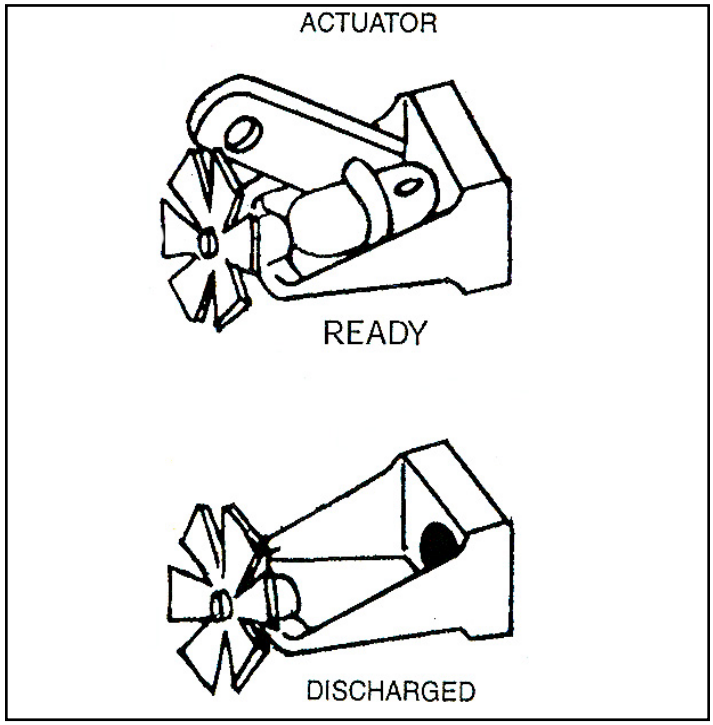
Inspect the pressure gauge before each outing. The illustration shows the ready and discharge condition of the actuator. Remove and weigh the unit (minus brackets) every 6 months on an accurate scale (Do not use any hand held scales). If weight is below that shown on the unit nameplate, it must be removed from service immediately. If leakage is suspected, brush liquid soap on all points of possible leaks, or submerge entire unit in clean fresh water and watch carefully for 5 or 10 minutes.
Leaks will appear as tiny bubbles. If leakage is found return to the factory immediately for repair or replacement.
Remember the two most important requirements to assure full charge and reliability of your Fireboy system are:

1. Visual inspection of the gauge and the actuator to determine if it has actuated.

2. Weighing to determine the true contents of the agent in the system.

All models from 75 cubic feet are rechargable. Recharging is possible only if the unit has leaked out verses losing agent due to a fire.

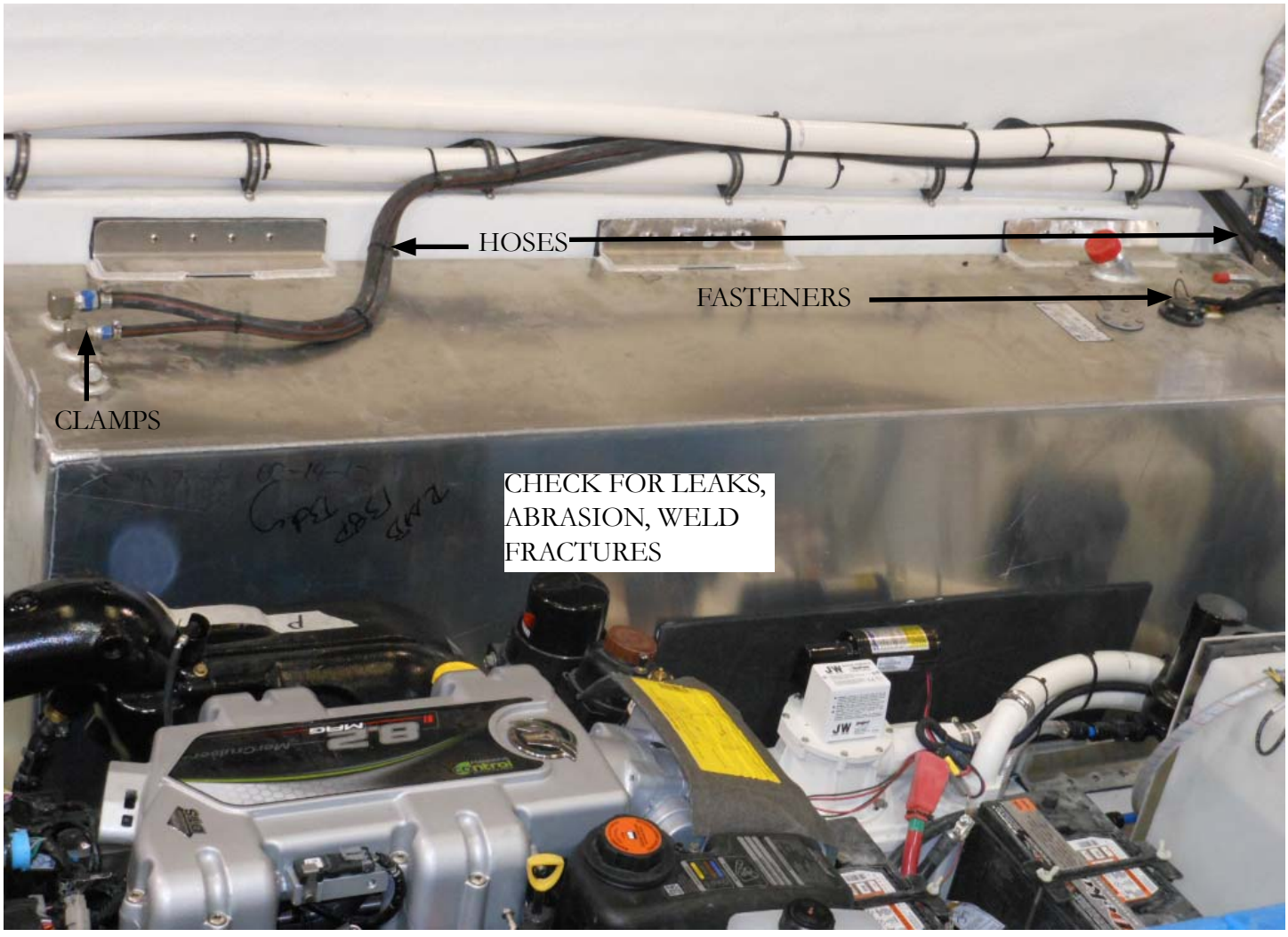
Should the indicator light fail to come ON when the ignition key is ON, first check the pressure gauge and actuator to see if the unit has discharged.If not check the breaker.
Next, using a continuity tester, check the electrical pressure switch on the system bottle itself. Pull the molded rubber connector off by pulling straight away from the manifold, and place the probes of the continuity tester directly on the spade connectors. This pressure switch should show a closed circuit.



Next, check the continuity of the entire wiring circuit. The indicator lamp is an LED (light emitting diode) and cannot be tested with a continuity tester.
A simple method to test LED'S is to remove the lamp and touch the red wire to the + terminal and the black wire to the - terminal of an ordinary 9 volt battery. Should the indicator lamp be faulty, replacement lamps are available from Fireboy.
Should the continuity of the pressure switch indicate an open circuit, the system will have to be returned to the factory for either replacement or repair.

FUEL SYSTEM

Periodically (at least twice annually) inspect the fuel tank components for loose clamps at the vent, fill, and feed locations. Examine each hose for signs of deterioration and leakage. Check the fuel sender for loose fasteners and leaks at all areas of contact. Also, inspect the fuel tank for signs of leakage or abrasion. Tighten all welding for sign of stress fractures. Check the plate fasteners on the angle supports especially on the engine room floor where they are fastened.
Note: Do a visual inspection before each cruise.



GENERATOR/TYPICAL

Overview

An optional generator may be installerd on your vessel. Read and become familiar with the generator owner's manual. It provides a variety of operational, safety and troubleshooting information. The output voltage under a full load can be easily periodically checked by observing the AC voltage meter found on the AC/DC panel. The output voltage should be between 110 -120 volts AC (60 hertz-US), and 220- 240 volts AC at (50 hertz- International). Voltages outside these specifications could indicate a generator malfunction. Make sure all fluid levels are checked before starting the generator. The generator seacock handle must be in-line with the seacock and the sea water strainer must be free from debris.

The generator features an automatic shut down system of sensors controlling high exhaust temperature, high water, low oil pressure, and high RPM. If one of these sensors engages, the generator will shut down. The source of the problem then needs to be determined. Use the owner's manual troubleshooting section as a reference.

There is a fuel filter in the system that periodically needs checking and cleaning. Refer to the owner's manual.

Disconnect the battery cables before doing any generator maintenance. Inspect and clean the carburetor flame arrestor periodically by blowing off with compressed air. Inspect all fuel system fittings for leakage periodically. Be sure proper ventilation is present when servicing the fuel system components. Inspect all water and heat exchanger fittings periodically for leaks. Repair or replace components as needed. Be sure the generator is completely cold before performing any maintenance on the water system due to possible hot water and or antifreeze filled components. Be sure to catch and dispose of any antifreeze coolant properly. Refer to the generator owner's manual regarding antifreeze type and quanity.

When refilling the crankcase with oil follow the specifications given in the owner's manual. Dispose of used oil in an environmentally friendly manner. Refer to the generator owner's manual for more information.

Note: Read and understand the following safety warnings before performing any maintenance procedures.

⚠ WARNING

AVOID SERIOUS INJURY FROM ACCIDENTAL GENERATOR STARTING! DISCONNECT THE BATTERY CABLES BEFORE WORKING ON THE GENERATOR.

⚠ WARNING

AVOID SERIOUS INJURY FROM A HOT GENERATOR AND EXHAUST SYSTEM. DO NOT WORK ON GENERATOR UNTIL THE UNIT COOLS.

⚠ WARNING

AVOID SERIOUS INJURY FROM ROTATING PARTS! OPERATE THE GENERATOR ONLY WHEN ALL SCREENS, COVERS & GUARDS ARE IN PLACE.

DATE RUN	OPERATING HOURS		SERVICE RECORD	
	HOURS RUN	TOTAL HOURS	SERVICE DATE	SERVICE

GROUND FAULT OUTLET (TYPICAL)

The GFCI (Ground Fault Circuit Interrupter. GFCI abbreviated) outlets should be tested monthly. To test the unit, depress the reset button. Then press the test button. The reset button should pop out.

If it does not, contact a qualified electrician or marine professional to replace the device.

Refer to Chapter 4 where it explains the system operation The GFCI is normally located at the beginning of a circuit so that all receptacles further down the circuit are protected. That could be a reason why several components plugged into outlets will not work when a GFCI is not functioning. There are normally 2 GFCI circuits on your boat.

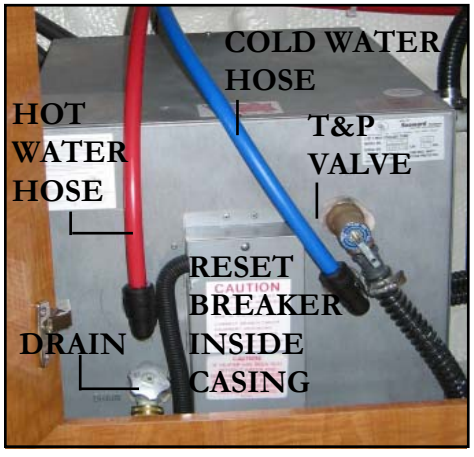
HEATER-HOT WATER

A. The most important maintenance factor with the hot water heater is that it is winterized with Winterban (RV anti-freeze; alcohol style) in freezing climates. Use the water heater drain valve to vacate water from the tank. The water will automatically drain into the shower sump pump and then will be sent overboard. *Make sure the water heater breaker is turned off before any winterization is started to prevent the element from being burned out.*

B. If the system is constantly being used in warmer climates it is a good idea to periodically drain the hot water valve for 30 seconds or so to eliminate any scale that has built up inside the hot water heater. Turn the breaker off as a precaution. Refill the hot water heater before activating the breaker to prevent element burn out.

C. The hot water heater and heat exchanger parts are made of aluminum. If engine flushing is required by the manufacturer be sure to disconnect the heat exchanger from the system temporarily.. The caustic chemicals will damage the hot water heater aluminum parts. Re-plumb the heat exchanger back after engine flushing.

D. Test the T& P valve periodically to make sure it works properly. Its purpose is to let off excess water vapor (steam) if the thermostat should stick and a critical temperature situation develops within the tank. Pull on the valve to test it. The water will vacate to the shower sump pump and then overboard.



HIGH WATER ALARM

The high water alarm float is located in the engine room. Periodic maintenance consists of visually inspecting the float grate cover for debris and removing any debris accumulation.

WARNING

TO PREVENT BODILY INJURY OR DEATH NEVER USE AUTO ANTIFREEZE IN A MARINE WATER SYSTEM OR ANY OF ITS PARTS. AUTO ANTI-FREEZE IS HIGHLY TOXIC AND POISONOUS TO THE HUMAN BODY.

HORN (TYPICAL AIR OPERATED)

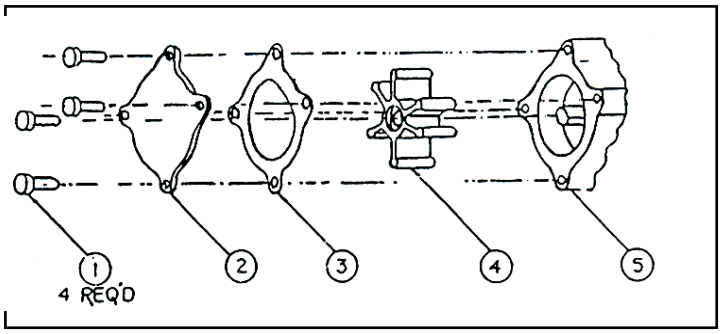
The typical air horn features an air pump which acts like a mini ari compressor.The horn emits a sound that can be heard much further than the typical electrical horn. This extra distance capability can be useful in ship to ship crossings especially when foul weather is present.

Check the horn assembly for debris and insect nests periodically. Use an auto grade chrome cleaner on the horn assembly at least annually. After each cruise, rinse the horn assembly with fresh water. Check the fasteners for tightness annually along with the deck sealant for complete sealing coverage.

Typical Air Horn Pump

Normally the air horn pump requires no maintenance. If problems exist contact your closest Regal dealer.

OIL CHANGE SYSTEM



The oil changer system requires little maintenance up to the 500 hour period. At that time the impeller needs to be replaced. Earlier replacement may be necessary if the oil changer has been operated dry, foreign objects have broken the impeller vanes down, or improper liquids have been run through the system. For impellers and gaskets, call 1-800-922-4804. Refer to the vendor documents for more information.

To change the impeller:

1. Remove the four screws(1).

2. Remove the cover plate (2) and old gasket (3).

3. With fingers, remove damaged or worn impeller (4).

4. Clean the inside of the pump looking for foreign materials and any partial impeller vanes that may be stuck in the chamber. Also, check the hose barbs and hoses leading to the outside for debris.

5. Apply Vasoline or similar lubricant to both the inside of the pump head (5) and to the outside of the impeller (4).

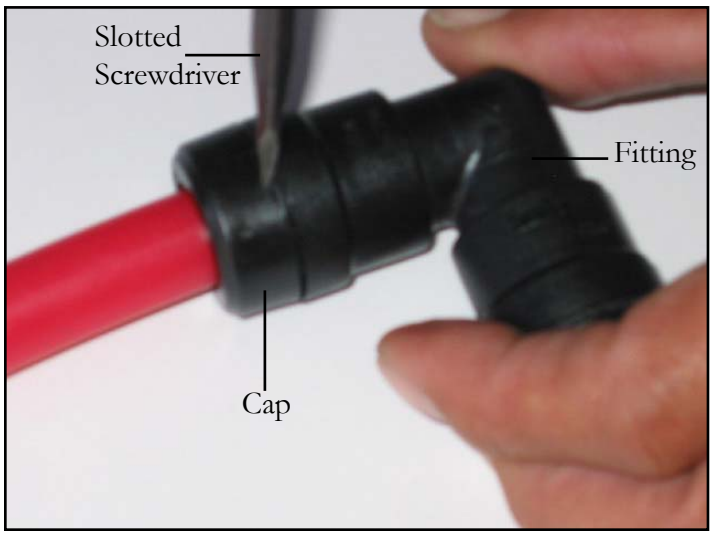
6. Align the flat surface on the inside of the new impeller with the flat surface on the motor shaft. Push into place while twisting the blades in a clockwise direction.

7. Place the new gasket (3) on the pump body face, align holes and replace cover (2). Tighten all 4 screws evenly.

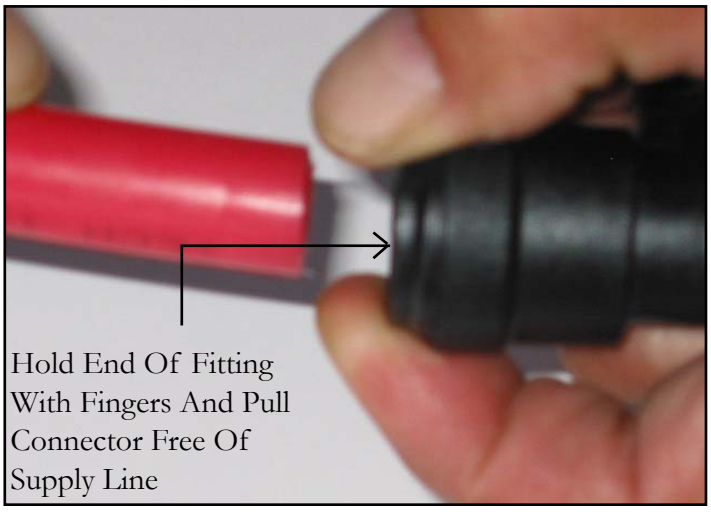
PLUMBING CONNECTORS

Plumbing connections to the red and blue fresh water lines require special instructions when they are to be removed or replaced. Be sure to turn off the water for that circuit at the manifold before starting any plumbing repairs.

1. To remove a tee, 90 degree, or straight connector fitting first remove the cap on the end of the fitting by using a slotted screwdriver. Insert the screwdriver in the cap slot and turn 90 degrees. Cap will release from the fitting.



2. Push the connector and collar together. Hold the collar next to the connector with your finger. Pull and the connector/collar will release itself from the water line.



To reinstall a plumbing connection to a water line make sure the line is cut off square and the end is smooth. This will aid in ensuring a leakproof connection.

1. Install the cap on the supply line. You may need to use a slotted screwdriver to remove the cap from a new fitting.

2. Simply push the fitting on to the supply line until pressure is felt. This ensures it is completly in the fitting.

3. Push the cap on the collar until it snaps in place.Turn on the water pressure and check for leaks.

Note: With the connector in place, a movement between the line and connector is normal.

PRESSURE PUMP-FRESH WATER

The fresh water system in general requires very little maintenance.

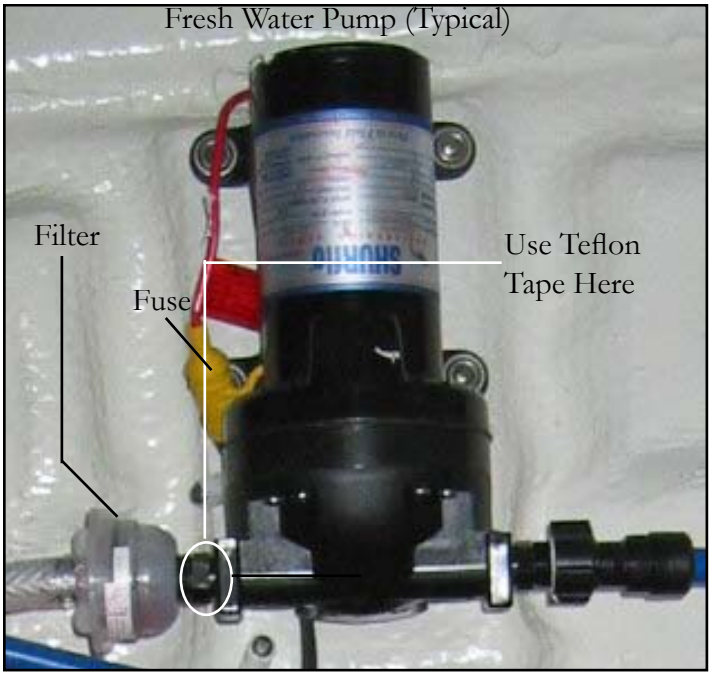
1. See the equipment operation chapter defining the recommended seasonal disinfection procedure.

2. The fresh water filter needs to be cleaned periodically. Simply remove the hose clamp and unscrew the fresh water filter to access the screen. Rinse the screen off to remove any foreign debris. Be sure to use teflon tape on the pump fitting threads before installing the filter. Reinstall the components and check for leaks.

3. Periodically check all fittings for leaks.

4. In colder climates, use Winterban or its equivalent in all the fresh water system components after draining the system.

5. Select units use a fuse located at the positive pump wire.



PUMP-OVERBOARD DISCHARGE

If your boat is equipped with an overboard discharge pump pay close attention to what materials are flushed through the waste system as it could become clogged. Do not pump garbage, rags, or sanitary napkins through the overboard discharge pump (macerator). Flush the waste tank and pump with fresh water with each pump out. Do not run the pump dry or for extended periods of time since the impeller can be damaged.

Pump the waste system out at decommissioning time and rinse fresh water through the entire system periodically to keep the hoses clean of debris especially the pump out hose.

SIRIUS MARINE WEATHER

If installed the Sirius weather system is a sealed unit. DO NOT remove the receiver cover. Adjustments require specialized service procedures and tools only available to qualified service technicians. There are no user serviceable parts of adjustments.
Always turn your weather system off before carrying out routine maintenance.
Peform the following periodically:

1. Examine the cables for signs of damage, such as chafing, cuts, or nicks.

2. Check that the cable connectors are firmly attached and dust caps are fitted to any connection not in use.

SHOWER SUMP PUMP-TYPICAL

The typical shower sump pump shown above is used to collect gray water waste from the sinks or the shower itself. After the liquid reaches a designated height, the sump pump energizes through a float switch and exits waste to a manifold then overboard. This system helps to protect our water supply by not dumping used water overboard. Periodically check the sump pump grate for debris such as hair and soap build up. Check to make sure the automatic float operates freely at all times. Also, clean out the box with a bleach/water solution as needed to kill bacteria. You can back flush using the bleach/water procedure. The sump pump box is located near the companionway stairway.

STEREO/DVD PLAYER/TELEVISION

Since most of the same cleaning and maintenance tips overlap on these entertainment components, they will be grouped together.

1. To clean the CD slots in stereos, DVD players use a dry or slightly water moistened swab to remove any buildup of debris. This monthly procedure will assist in preventing the CD discs from being scratched.

2. To clean the faceplates of the various units use a dry soft cloth. If the faceplate is stained badly, use a moist cloth with a neutral cleaner. Do not use harsh, caustic or alcohol based chemicals to keep the letters from coming off the faceplate. Do not use silicone spray or WD-40 since they could damage mechanical parts.

3. If these units will not play CD's properly it they may have developed condensation. Wait 1 hour and retry.

4. Keep all remote controls out of extreme heat and high moisture environments. Change batteries often for best operation.

5. Periodically check CD discs for scratched and dirty ones. Clean the dirty ones with a cleaning kit which can be purchased at most electronic stores.

6. With flat screen televisions, do not attempt to service the unit yourself since high voltage exists.

7. To clean the flat screen display, dampen a soft cloth with water or a mild detergent. The best cleaner is a screen cleaning tissue specifically designed for antistatic coating. Never use flammable cleaning materials or glass cleaners with ammonia since they attack the television screen surface.

TELEVISION FLAT SCREEN MONITOR

These cleaning recommendations cover TV's that may be installed in the salon, forward or mid cabin.
Regular cleaning of the these units will help extend their life. Turn the power off at the breaker before you begin any cleaning procedure.

Cleaning The Screen

Wet a soft cloth in a mixture of warm water and fabric softener or dish washing detergent. Wring out the cloth until it is almost dry. Wipe the screen to remove dust and debris.
Remove any excess water from the screen and let the screen air-dry before you activate the television breaker and turn the unit on.

Cleaning The Cabinet

Use a soft, lint-free cloth to clean the cabinet off. Again, do not use a wet cloth.

NOTICE

WHEN LEFT FOR EXTENDED PERIODS
TURN THE TELEVISION BREAKER
TO THE OFF POSITION TO HELP PREVENT
POWER SURGES OR LIGHTNING DAMAGE.

NOTICE

TO PROTECT THE INTERNAL TELEVISION
COMPONENTS OF THE TELEVISION
REMOVE THE TELEVISION FROM THE
VESSEL IN FREEZING CLIMATES.
CONTACT YOUR REGAL DEALER
FOR TECHNICAL SERVICE.

TRIM TABS

Trim tabs are located on the outer edges of your vessel's transom below the swim platform. All mechanical and electrical connections should be periodically checked for tightness, corrosion, and chafing. If a malfunctioning tab is suspected, run each tab in and out while someone looks at each tab to make sure it is moving up and down the proper distance. **Replace any zinc anodes mounted on trib tabs when at one half their life as determined by size. Check anodes twice a month.**

Check the hydraulic power unit fluid (HPU) level. The pump is located in the bilge (sump) close to the transom. To refill, remove the lexan cover and filler plug. Fill with any type automatic transmission fluid (ATF). The fluid level should be 2" from the reservoir bottom.

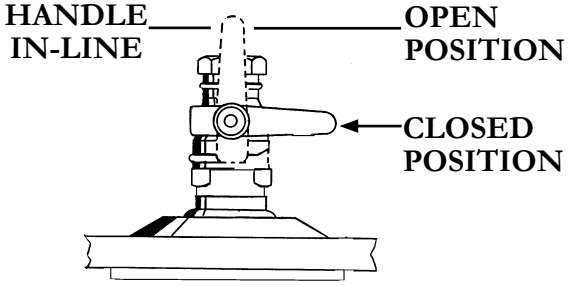
The trim tabs may be painted for corrosion protection. **Do not paint the anodes** as they protect the tabs from galvanic corrosion.

TYPICAL TRIM TAB PUMP

UNDERWATER HARDWARE-SEACOCKS & STRAINERS

Inspect the thru-hull seacocks before each outing. Make sure the connections between the output hose and the valve are tight. Look for water leaks around the area where the valve and hull meet.

Every 30 days open and close each thru-hull valve several times. This will guard against the valve seizing in the open or closed position. Also, make sure the valve handle is tightly fastened. Secure any loose valve handles.



TYPICAL SEACOCK

TYPICAL STRAINER

Before servicing the sea water strainer make sure the appropriate seacock has been closed to prevent water entering the boat. If possible blow out the strainer basket with compressed air or use a metal type brush to remove any accumulated material from the screening material. Make sure the strainer is centered on reinstallation.

Check all parts for wear and possible leaks including any gasket surfaces. Do not overtighten the strainer hold down fasteners which could cause strainer body damage especiallyon the newer plastic versions. Use original replacement marine parts only. After all parts are reassembled open the seacock and check for leaks.

TOILET-VACUUM DESIGN

Vacuum style toilet systems need to be cleaned periodically for maximum sanitation and operational efficiency. Clean the bowl with a cleaner such as Bon Ami which will not abrade the toilet bowl lining. Do not use chlorine solvents or caustic chemicals such as drain openers because the various system seals may be damaged.
Use the following procedure **monthly** or when leaving the vessel for extended periods.

1. Fill bowl with water.

2. Add 1 cup of biodegradable powdered laundry detergent.

3. Flush toilet by pressing the pedal for about 2 minutes. Release foot pedal to close flush ball.

4. Most marinas offer a service that uses a vacuum hose connected to the deck waste fitting that pulls the waste from the tank. We suggest using a hose after the process and shoot a few bursts of fresh water down the waste fitting at the deck. This helps the residue left from the pump-out process from building up in the waste hose.

If an odor is apparent from the system try the following:

1. Clean the system out using the above procedure.

2. Check to see that the vent from the holding tank to thru-hull fitting is not clogged.

3. Periodically add the correct holding tank deodorant either Secure or Sealand liquid.

4. Annually replace the in-line vent wase filter normally located in the bilge. This filter can be ordered from a Regal dealer or your local marine supply store.

5. Refer to the toilet manual for further information.

VACUUM CLEANER

CLEANING STRETCH HOSE

The stretch hose on occasion has a tendency to get clogged especially if you have pets on board. To clean the hose:

1. Lift the hose up at both ends and dispense some liquid detergent into both ends.

2. With a garden hose, holding both ends still up, fill 3/4 with water.

3. Shake hose up and down, let detergent loosen the dirt and clogged debris.

4. Stretch the hose as far as you can (2 people required) and wash the dirt out with the full pressure of a garden hose. Repeat as necessary.

5. Hang hose up on one end. Let hose drain and dry completely.

TYPICAL MAINTENANCE SCHEDULE- ENGINE/PROPULSION

WARNING

AVOID PERSONAL INJURY
BEFORE PERFORMING ANY MAINTENANCE WORK READ AND UNDERSTAND THE OWNER'S MANUAL. IT CONTAINS THE RECOMMENDED PROCEDURES.

NOTICE

MAINTENANCE POINTS MARKED WITH A * MUST BE PERFORMED BY AN AUTHORIZED VOLVO PENTA DEALER.

Your propulsion package is designed to provide many years of reliability and satisfaction. To keep the unit running at peak performance a service maintenance schedule is recommended. *Refer to the engine/drive operation manual for detailed information or contact your authorized Regal center.*

NOTICE

MAINTENANCE SCHEDULES ON ENGINES OFTEN CHANGE AS IMPROVEMENTS ARE MADE WITH THE PRODUCT. ALWAYS VALIDATE ENGINE INFORMATION FOUND IN THIS MANUAL BY CHECKING WITH AN AUTHORIZED REGAL DEALER.

WINDLASS

The typical windlass needs periodic maintenance to keep it in top running condition. Every 6 months the manufacturer recommends that the unit be disassembled and all the above deck parts be washed down with fresh water. Lightly oil (SAE 10) the seal, shaft, cone clutch and spline. Ensure that the base, below the gipsy, is cleaned well and the sealing ring is checked. Grease the threads on the chain pipe cover and stripper screws before re-assembly.
The bearing is self lubricating and should not require servicing.
Below the deck check regularly the condition of the motor/gear box and terminals and re-apply grease when necessary. The motor/gear box is two part epoxy painted to protect it against corrosion as it is constructed of steel and lives in the harshest environment on your craft. If corrosion on the motor is evident, clean and repaint with marine grade oil based enamel paint.

Note: Refer to the windlass operator's manual for additional and more detailed maintenance information.

WARNING

TO PREVENT BODILY INJURY
REMOVE THE CHAIN FROM WINDLASS
BEFORE PERFORMING MAINTENANCE.

Troubleshooting

DIAGNOSTIC CHARTS

Note: A portion of the following troubleshooting charts may not apply to your vessel. The following diagnostic charts will assist you in identifying minor electrical, electronic, fuel, and mechanical problems. Some of the items listed require technical training and tools. Additional up-to-date information is available in the various operation manuals as select items and their troubleshooting techniques may change since the printing of this manual and/or are too numerous to cover under one publication such as electronics components.
Contact your closest Regal dealer, marine professional or internet for further information.
Many times the root cause of a problem can be found using a step by step process of elimination.

WARNING

AVOID BODILY INJURY AND DEATH!
BEFORE PERFORMING ANY MAINTENANCE WORK TURN OFF THE BATTERY SWITCH AND REMOVE THE KEYS FROM THE IGNITION SWITCH.

CAUTION

TO AVOID BODILY INJURY!
USE ONLY APPROVED MARINE REPLACEMENT PARTS.

CAUTION

TO AVOID BODILY INJURY!
SOME EQUIPMENT CONTAINS HIGH VOLTAGE. USE CAUTION WHEN SERVICING ELECTRICAL COMPONENTS.

BOTTOM PAINT

Factory installed antifouling paint is a top-of-the-line product but does need periodic touching up. No paint can be effective under all conditions of exposure. Man made pollution and natural occurrences can adversely affect antifouling paint performance. Extreme hot and cold water temperatures, silt, dirt, oil, brackish water and even electroylis can deminish the effects of antifouling paint.

Therefore, the vessel bottom needs to be checked periodically to make sure it is clean and no growth is occurring. Lightly scrub the bottom with a soft brush to remove anything from the antifouling surface. Scrubbing is particularly important with vessels that are idle for extended periods of time.

The bottom coating is most effective when the boat is being used on a continuous basis.

On select vessels maintain a 1 1/2" clearance from all anodes, drive units and other underwater gear. Never paint over anodes as they will cease to work properly.

Bottom paint needs to be periodically refurbished. Contact your Regal dealer or a marine professional for additional information.

ELECTRICAL DIAGNOSTICS (AC)

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
No AC power	Main shore power breakers tripped or in "off" position	Energize shore power inlet breakers
	Dock power in "off" position	Activate dockside power
	Shore power cord not connected	Plug in shore power cord; twist to lock
	Faulty connection	Repair as needed
	Marina dockside power down	Possible transformer malfunction
	Shore inlet breaker tripped	. Reset breaker.
No power to AC outlets and/or equipment	Main AC ship's panel breakers tripped or in "off" position	Reset or activate main breakers
	Shore power cord not connected	Plug in shore power cord
	GFCI tripped	Find cause of trip. Reset GFIC
Main ship's breaker continues to trip	Faully main breaker	Contact yacht authorized dealer
Inadequate AC power with genset running	Electrical demand greater than electrical output	Turn off appropriate equipment breakers to lessen load

ELECTRICAL DIAGNOSTICS (DC)

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
No DC (12 volt) power	Battery switch in "off" position	Turn selector switch to "on" position,
	Weak or dead battery	Charge or replace battery
Battery not charging (engine running)	Loose belt	Tighten belt
	Faulty alternator	Repair/replace alternator
	Faulty volt meter	Replace volt meter
Battery will not hold charge	Faulty or old battery	Replace battery; use exact replacement
12 volt equipment not working	Equipment switch in "off" position	Switch to "on"position
	Circuit breaker/fuse blown	Reset breaker. Replace fuse.
	Weak or dead battery	Replace battery
	Corroded connection	Eliminaate corrosion
	Loose wire	Tighten connection
	Internal equipment short	Replace equipment component

ELECTRONICS- GENERAL

The Garmin electronic packages installed on present vessels are very system specific when troubleshooting. Each package is very unique and we could not cover all the systems here. Therefore, refer to the vendor supplied operator's manual for specific troubleshooting information related to an individual electronic component.

In addition, helpful information is readily available on the internet at each vendor site for the retail customer. Information can be downloaded as needed with additional online contact and tech services available. Also, contact your closest Regal dealer where you will find factory trained professionals to assist you in solving more technical electronic component issues.

FRESH WATER DIAGNOSTIC CHART

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Air in water system	Water tank empty	Fill water tank. With pump "on" bleed air from lines until water flows without air.
Fresh water pump cycles on and off	Water system leak	Locate & repair water leak.
No water at sink faucet	Breaker blown	Reset breaker
	Water tank empty	Refill water tank
	Switch turned off	Turn switch to "on" position
	Blocked water filter; pinched line	Clear obstruction or straighten line; clean water filter
	Manifold valve turned off	Turn on manifold valve
	Loose or disconnected wire	Check wire connections
Low water pressure	Defective fresh water pump	Replace water pump
Weak pressure at transom shower	Line pinched	Find/Repair pinched line
Water to pump. No output.	Faulty fresh water pump/pressure switch	Replace fresh water pump or pressure switch
Fresh water pump continues to cycle	Defective pump pressure switch	Replace pressure switch

INSTRUMENT DIAGNOSTIC CHART

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
No reading on gauge or gauge reads wrong	Faulty gauge	Replace gauge
	Wiring to gauge faulty	Inspect/repair wiring
	Faulty sender	Replace sender
Gauge reads erratic	Loose ground or hot wire	Repair/replace wire and/or connection

PERFORMANCE DIAGNOSTICS

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Excessive vibration	Material obstructing propeller	Reverse engines to remove material
	Bent drive propeller shaft	Call authorized Regal/Volvo dealer
	Bent propeller blade	Repair/replace propeller
	Noisy drive bearing	Repair drive unit
	Damaged drive casting	Replace damaged casting
Poor performance	Trim incorrect	Adjust trim
	Unbalanced load	Adjust load
	Engine problem	Call authorized Regal/Volvo dealer
Engine speed/rpm is low	Growth on hull	Hoist vessel; clean bottom
	Poor quality fuel	Call authorized Regal/Volvo dealer
	Accumulation of bilge water	Check for leaks
	Trim tab in “up” position	Check trim tab functions/pump fluid levels

REFRIGERATOR DIAGNOSTIC CHART

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Refrigerator not cold	Compressor will not start	Turn breaker on at the main ship's service panel
	Thermostat set too high or on/off switch is in the off position	Reset thermostat or activate on-off switch
	Compressor starts but does not cool fridge	Contact repair professional
	Door latch not closing or door seal not seated	Adjust latch or replace seal
	Condensor dirty	Remove fridge/clean coils with brush or vacuum
Not running on DC	Check for defective thermostat or converter, low battery	Relace thermostat, converter or battery
Not running on AC	Inadequate input voltage	Make sure proper voltage exists on ship's main AC panel.

SIRIUS MARINE WEATHER

LED STATUS

The LED on the connector panel provides valuable troubleshooting information on the status of your weather system.

The LED blinks green while the system is operating normally. If the unit detects a problem, the LED blinks amber to indicate a warning or red to indicate an error. The pattern ot the LED blink is a code representing the nature of the problem. For multiple warnings/errors the codes are given in sequence with a 1.5 second pause between the indications.

It is normal during the first minute of initial power that the SR100 status LED shows no activity and remains off. During the second minute the status LED will start to flash the amber or red fault strings. Typically, during normal operation, a flashing green LED will occur within 90 seconds of initial power. If there is no LED indicaiton of any sort displayed after 90 seconds you should check the circuit breaker.

A blinking red LED indicates an internal fault condition and a marine electronics technician should be contacted.

TELEVISION DIAGNOSTIC CHART

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Screen is black. Power indicator is off.	TV breaker not activated	Activate TV breaker on ship's main service AC panel.
	TV and/or DVD not turned on.	Activate TV or DVD player.
TV signal weak.	TV antenna breaker not activated or wrong antenna breaker in use.	Activate TV antenna breaker. Check antenna switch for proper signal button.
Image too light or dark.	Brightness or contrast improperly adjusted.	Readjust brightness or contast to owner's manual specifications.
Horizontal bars appear to flicker, jitter, or shimmer on the image.	Fine function not adjusted properly.	Adust fine function to owners manual specifications.
Vertical bars appear to flicker, jitter or shimmer on the image.	Coarse function not adjusted properly.	Adjust coarse function. Then adjust fine function.
Screen is blank and power indicator light is steady amber or blinks every 1/2 or 1 second.	Power management system being used.	See power saver in owner's manual.
Image not centered on screen	Horizontal or vertical adjustments off.	Readjust horizonizl or vertical controls.

TOILET-DIAGNOSTIC CHART
VACUFLUSH®

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Warer will not stay in bowl	Loose clamp ring Improper seal around flush ball or deris on underside of teflon seal. Worn or damaged seal or flush ball	Tighten clamp ring adjusting nut Look for foreign objects at flush ball Replace seal or flush ball Clean water valve or replace
Toilet overflows	Dirt stuck in water valve seal or bad seal Cam strap bent down holding valve open	Clean water valve or replace Bend front of strap up 1/16”
Water does not enter toilet bowl properly	Low water pressure Water valve closed	Check incoming preesure Clean filter on water valve inlet
Water leaking at water valve	Loose connection Worn or defective water valve	Tighten cap, inlet fitting, clamp Replace water valve
Water leaking at bowl rear	Loose hose connection Loose or worn vacuum breaker	Tighten connection Tighten/Replace vacuum breaker
Pump runs excessively between flushes	Flush ball leaks Vacuum line leaks Duckbill valves in pump not sealing Pump bellows in vacuum generator worn	See problems 1 & 2 Tighten all connections at toilet & vacuum generator Inspect all duckbill valves for poor sealing Inspect for small holes or rip
Toilet will not flush	Plugged vacuum line, vacuum pump discharge or intake lines Duckbill valves inverted to clogged discharge line or seacock	Clear line(s) Replace valves

TOILET-DIAGNOSTIC CHART
VACUFLUSH®

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Pump will not run	No power Loose or broken electric wire Faulty motor	Check DC breaker Check wires at pump, vacuum generator, vacuum switch (B terminal connector Replace motor
Pump will not shut off	Insufficient vacuum Excessive vacuum leak Faulty vacuum switch	Check for 10 " of vacuum See pump running between flushes Check by removing 1 of B wires
Pump running too slow, overheating or blowing breaker	Improper voltage Loose or broken wire Discharge line blocked causing back pressure Plugged or defective duckbill valve	Check input voltage Find & replace wire Check lines/seacock; clean discharge line Clean or replace duckbill valve
Pump emits odor	Loose or defective hose connection on pump Loose intake or discharge fittings on pump Worn, torn or punctured pump bellows or diaphragm	Tighten connections or replace hose Tighten all fittings on pump or replace all nipples/adapters as needed Replace pump bellows or diaphragm
Blockage between toilet and vacuum generator	Collased or kinked vacuum line Flusing foreign objects down the toilet	Inspect & repair vacuum lines Do not flush non-dissolving objects or excessive tissue down the toilet

VACUUM CLEANING SYSTEM

If The Motor Stops Suddenly:

1. The most common cause is a clogged hose. Try to unclog the hose with a long stick or by shaking the hose until the clogged debris clears.

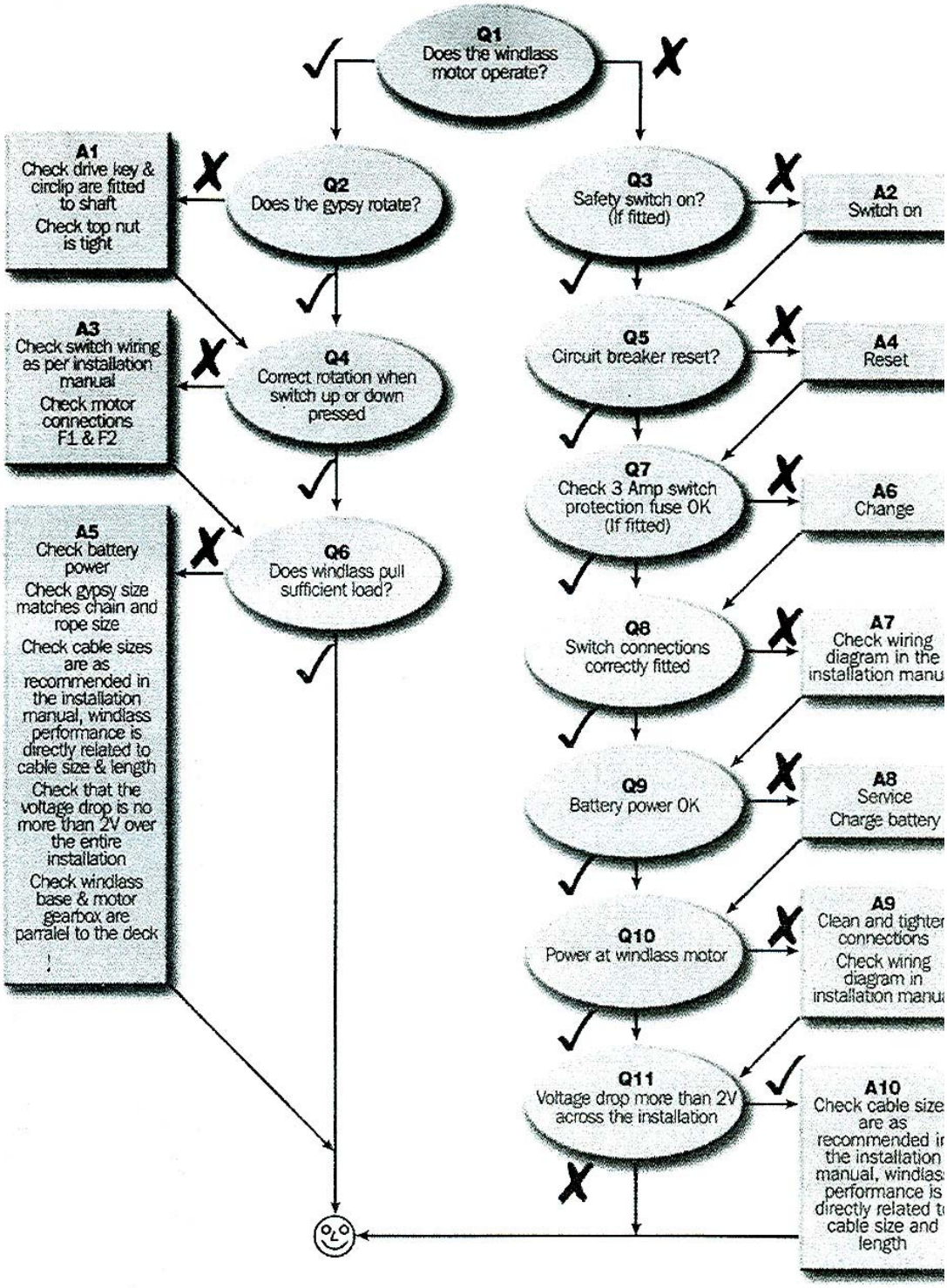
2. The bag is overfilled and fine dust has clogged the bag.

3. The vacuum cleaning tools are clogged.

4. The motor (exhaust) filter is dirty and should be cleaned or replaced.

5. Ensure that the area around the main unit is free of clutter to provide proper amount air to the unit. This will help prevent the unit from shutting down.

TYPICAL WINDLASS


Q1
Does the windlass motor operate?
Q2
Does the gypsy rotate?
Q3
Safety switch on? (If fitted)
A1
Check drive key & circlip are fitted to shaft
Check top nut is tight
A2
Switch on
Q4
Correct rotation when switch up or down pressed
Q5
Circuit breaker reset?
A3
Check switch wiring as per installation manual
Check motor connections F1 & F2
A4
Reset
Q6
Does windlass pull sufficient load?
Q7
Check 3 Amp switch protection fuse OK (If fitted)
A5
Check battery power
Check gypsy size matches chain and rope size
Check cable sizes are as recommended in the installation manual, windlass performance is directly related to cable size & length
Check that the voltage drop is no more than 2V over the entire installation
Check windlass base & motor gearbox are parralel to the deck
A6
Change
Q8
Switch connections correctly fitted
A7
Check wiring diagram in the installation manu
Q9
Battery power OK
A8
Service
Charge battery
Q10
Power at windlass motor
A9
Clean and tighter connections
Check wiring diagram in installation manu
Q11
Voltage drop more than 2V across the installation
A10
Check cable size are as recommended i the installation manual, windlas performance is directly related t cable size and length

Storage & Winterization

NOTICE

YOUR WARRANTY DOES NOT COVER DAMAGE TO YOUR BOAT IF IT IS NOT PROPERLY STORED AND WINTERIZED. CHECK WITH A REGAL DEALER OR MARINE PROFESSIONAL ABOUT WINTERIZATION PROCEDURES.

NOTICE

REMOVE ALL BATTERIES WHEN VESSEL IS STORED FOR EXTENDED PERIODS

⚠ WARNING

EXPLOSION, FIRE & POLLUTION HAZARD!
DO NOT FILL FUEL TANK TO RATED CAPACITY.
LEAVE ROOM FOR EXPANSION.

INTRODUCTION

Storage procedures are outlined in this chapter. These are general guidelines to follow in colder climates. Be sure to familiarize yourself with all relevant information in the owner's packet. Special winterization procedures are necessary for the boat equipment and systems. Use the enclosed checklists to help you identify areas of concern and maintenance. These lists cover land stored boats either inside or outside.

All in all, it is best to contact your closest Regal dealer or marine professional for winterization information. They possess the advanced service know how needed to tackle the more complex boat systems.

DECOMMISSIONING CHECKLIST

BOAT

☐ Check hull bottom for any fiberglass damage. Repair as needed.

☐Apply a coat of wax to hull and deck surfaces.

☐ Pour a pint of 50/50 antifreeze into bilge pump.

☐ Remove batteries. Trickle charge over extended periods. Do not set batteries on cement. Use wood blocks.

☐Remove all loose gear from boat such as life jackets, etc. Inspect and store in cool, dry environment.

☐Remove drain plug. Clean drain plug hole of debris as needed. Enclose drain plug in plastic bag and tie to steering wheel.

☐ Drain the waste system per instructions in this chapter. Make sure bow is higher than stern to permit proper drainage.

☐ Clean all upholstery and store so it breathes.

☐ Conduct a visual inspection to ensure boat is balanced properly. Bow should sit slightly up especially if outside.

☐ Cover boat and tie down for wind protection if outside. Prop cover up as needed to provide proper ventilation. Be sure not to cover up the fuel vents. Shrink wrap with vents is another choice for outside storage protection.

☐ Drain the fresh water system per instructions in this chapter.

☐ Send in appropriate equipment for calibration such as the automatic fire extinguisher canister or CO detectors.

☐ *Never use blocking to support the hull bottom as structural hull damage may occur to the vessel.*

ENGINES

The propulsion systems on your vessel are complex by design. In colder climates, it is recommended that your Regal dealer winterize your boat's engines. Regal dealers have undergone extensive factory training covering the Regal yacht product line. Also, the dealer is equipped with the parts and tools to perform a care free winterization procedure.

☐ Run engine. Pour a fuel stabilizer/conditioner in the fuel tank. Allow time for it to circulate through the fuel system. Top off fuel tanks to help prevent condensation.

☐ Change all engine fluids as referenced in the engine manufacturer's owners manual.

☐ Drain cooling and exhaust system or have a marine professional "pickle" the engine with antifreeze and rust preventative.

☐ Spray all exterior parts with a rust preventative.

GENERAL NOTES ON ANTIFREEZE

Engine cooling fluids must be replaced with a marine antifreeze solution; mix antifreeze according to directions for the lowest expected temperature. The above method is much more reliable than just draining the engines and manifolds because sometimes pockets of water can form which can freeze in cold temperatures and cause engine damage. Draining the system fosters rust in engine parts. Historically, antifreeze was originally made with methanol. It was because of its chemical nature to escape into the atmosphere and a high corrosion factor on engine metals that it was replaced.

Today, ethylene glycol is used in auto and marine engine applications because of its positive thermal properties. On the downside ethylene glycol contains silicate rust inhibitors that can clog up marine heat exchanger surfaces. This is why it is so important to follow the engine manufacturer maintenance schedules which include changing the antifreeze periodically. In addition, the unpleasant odor of antifreeze is caused by tolytriazole which also contributes to it being environmentally hazardous. **Notwithstanding, ethylene glycol is poisonous to the human body along with animals.** Therefore, it cannot be used in potable marine water systems.

Propylene glycol is considerably less toxic and retail products are labeled as "non-toxic antifreeze". It is the product of choice for marine water and waste tanks in freezing climates. It is available at marinas, RV dealerships, and retail marine outlets.

NOTICE

USE A SPECIAL NON-TOXIC ANTIFREEZE IN THE FRESH WATER & WASTE SYSTEM WHICH IS AVAILABLE AT RV AND MARINE DEALERS.

DO NOT USE AN AUTOMOTIVE TYPE ANTIFREEZE. IT CAN BE HIGHLY POISONOUS AND CORROSIVE.

STERN DRIVE UNITS

Use the services of a Regal dealer to ensure the drive units are winterized and have their seasonal maintenance. Your Regal dealer can check all drive related systems along with the installed propellers. This is a great time to have the propellers checked for balance and knicks.

Also, when the the propellers and hardware are off the propeller shaft and seals can be checked for vacuum and pressure leakage along with touching up the drive unit.

Refer to your engine operator's manual for specific drive information and maintenance schedules.

AIR CONDITIONING:

There are several methods of winterization; some work better than others. The various methods employed using a 50/50 biodegradable antifreeze/water solution are:

1. Pumping of antifreeze solution into the overboard thru-hull fitting, and discharging through the intake thru-hull fitting.

2. Use of the seawater pump to move antifreeze solution through the system and discharging through the overboard thru-hull fitting. Close the seacock, remove the hose for the strainer outlet, raise the hose above the AC pump (to prevent lose of prime) and pour in antifreeze solution. Pump solution through system. The strainer and hose to seacock will also need to be drained.

3. Use of pressurized air to force water from the intake through the overboard discharge.

Note: Any method that causes the antifreeze solution to flow downward is the method of choice. By this means, the antifreeze solution will displace any water trapped and eiliminate the possibility of freezing in hidden areas. In addition, since the seawater pump utilizes a magnetically driven impeller, the impeller whould be removed from the wet end assembly, wiped with an alcohol solution, and stored in a warm, dry area until commissioning takes place.

NOTICE

FOR THE PURPOSE OF PROTECTING
THE ENVIRONMENT,
DISPOSE OF ANY CONTAMINATED
ACID SOLUTIONS
IN ACCORDANCE WITH
FEDERAL,STATE AND/OR LOCAL
REGULATIONS.

BATTERIES:

Remove the batteries and check the electrolyte level. Store in a cool, dry place. Add distilled water as necessary to top off the battery.
Monthly recharging or continuous trickle charging should be done to insure the battery life during storage. Do not store a battery on cement as it may discharge.

FUEL TANK

Fill the fuel tank to minimize condensation but do not overfill. Leave enough space for fuel to expand and add a fuel stabilizer prior to storage following the manufacturer's recommended procedures.

TELEVISION:

The television manufacturer recommends that the unit be removed from the vessel in freezing climates. To remove the flat screen do the following:

1. Pull out the power plug from the rear of the television.

2. Unscrew the antenna cable.

3. While someone holds the flat screen, remove the screws that hold the television to the bracket.

4. Do not touch the flat screen or push in on it while trying to remove the unit as component damage may result.

5. Remove the television and store at room temperature.

WASTE/TOILET SYSTEM:

1. Pump out waste holding tank, flush the tank with fresh water and then a second pump out is recommended.

2. With non-toxic propylene glycol antifreeze in the fresh water tank, operate head until antifreeze flows into bowl of each head. Allow time between flushes for the vacuum to build up.

3. Operate macerator until antifreeze has a steady flow coming from the discharge fitting. Pour non-toxic propylene glycol antifreeze solution in head and flush head as needed to produce enough flow to winterize the macerator.

4. Leave at least 2 gallons of non-toxic propylene glycol antifreeze solution in the holding tank during storage.

NOTICE

USE A SPECIAL NON-TOXIC ANTIFREEZE IN THE FRESH WATER & WASTE SYSTEM WHICH IS AVAILABLE AT RV AND MARINE DEALERS.
DO NOT USE AN AUTOMOTIVE TYPE ANTIFREEZE. IT CAN BE HIGHLY POISONOUS AND CORROSIVE.

WATER SYSTEM-FRESH

1. Turn on the fresh water pump switch.

2. Open all faucets including transom shower and allow tank to empty.

3. Drain the water heater; shut off water pump switch.

4. Mix nontoxic antifreeze with water in accordance with the manufacturer's recommendations.

5. Pour solution into the fresh water tank.

6. Turn on fresh water pump switch.

7. Open each cold water faucet one by one beginning with the one furthest away from the tank and purge the system until a steady stream flows from the faucet. Then close the faucet.

8. Repeat step 7 for hot water faucets.

9. Shut off water pump switch.

10. Pour a quart of antifreeze into shower drain. Run the shower pump until a steady stream flows from the discharge fitting.

11. Leave at least 2 gallons of antifreeze solution in the holding tank during storage.

Glossary & Index

Following is a brief list of basic nautical terms useful in everyday boating experiences and communications. For more detailed glossaries of nautical terminology we recommend you check your local library, the internet or a marine store for boating books.

GLOSSARY

Abeam: at right angles to the fore and aft line and off the boat

Aboard: on or in the boat

Above: the part of the boat on a bavin vessel which is above the interor of the boat

Aft, After: aft is the boat section toward the stern or back of the boat

Admidships: toward the center of the boat from either side to side or rear to front

Beam: the width of a boat at its widest part

Bilge: the lower interior of the hull of the boat

Bitter end: the end of a line also the end of an anchor line

Bow: the front, or forward part of the boat

Bulkhead: the vertical partition or wall of a boat

Cast off: to let go or release

Chine: the line fore and aft formed by the intersection of the side and bottom of the boat

Chock: deck fitting used to secure or guide anchor or tie lines

Cleat: deck fitting with protruding arms around which lines are secured

Cockpit: the seating space used to accomodate passengers

Cuddy: a small cabin in the fore part of the boat

Deck: the open flooring surface on which crew and passengers walk

Draft: the depth from the waterline of the boat to the lowest part of the boat, which indicates how much water is required to float the boat

Fathom: a measurement of depth; one fathom equals six feet

Fender: a cushion hung from the side of a boat to prevent it from rubbing against a dock or against other boats

Fend off: to push off to avoid sharp contact with dock or other vessel

Fore: the part of the boat toward the bow or front

Freeboard: the height of the top side from the waterline to the deck at its shortest point. (The distance from the sheer or gunwale to the water)

Galley: cooking area

Gunwale: rail or upper edge of the side of the boat

Hatch: an opening in the deck to provide access below

Head: toilet

Hull: the part of the hull from the deck down

IPS: inboard propulsion system by Volvo

Keel: the lowest point of a boat

Knots: a measurement of speed indicating nautical miles per hour

Lee: the side opposite that from which the wind is blowing: the side sheltered from the wind

Leeward: the direction toward which the wind is blowing

PFD: personal floatation device; required for each person aboard

Port: the left side of the boat when facing forward (an easy way to remember the difference between "port" and "starboard" is that both "port" and "left" have four letters)

Shank: the main body of an anchor

Sheer: the curve of the boat's deck from fore to aft when seen from the side

Starboard: the right side of the boat when facing forward

Stern: the aft end of the boat

Stern drive: an inboard/outboard (IO)unit

Stringer: strengthening integral unit fastened from fore to aft inside the hull and fiberglass encapsulated for added strength: much like the skeleton system of our body

Top off: to fill up a tank

Transom: the vertical part of the stern.

Trim: the boat's balance when properly loaded

Wake: the path of a boat left astern in the water

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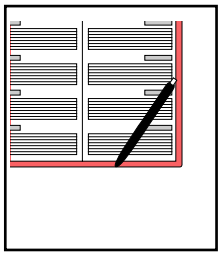


Note that all product specifications, models, standard, optional equipment, systems, along with the technical information is subject to change without notice.

For more information contact your nearest authorized Regal dealer. For the location of your nearest authorized dealer call 407-851-4360 or you can contact Regal through the internet at : **www.regalboats.com.** Your Regal dealer has received special factory training on the entire product line and his services should be employed to solve more technical problems.

A portion of the typical technical drawings found in this chapter are actual product drawings from the Regal factory. These drawings should be of special interest in mechanical and electrical troubleshooting. The equipment in the drawings is discussed in the various sections of this manual. Understanding specific systems and related drawings will go a long ways in solving problems.

Note: Drawings and specifications can change at any time.

TYPICAL LABEL LOCATIONS

NOTICE
Retrieval of Windless Chain
Winch operator may be required to periodically spread chain out within anchor locker

CAUTION © 1994 Taylor Made Systems™ New York -TO AVOID INJURY, GLASS DOOR MUST BE SECURED IN A CLOSED AND LOCKED POSITION WHEN BOAT IS UNDER WAY. USE BOTH TURN LOCKS TO SECURE DOOR.

SLING

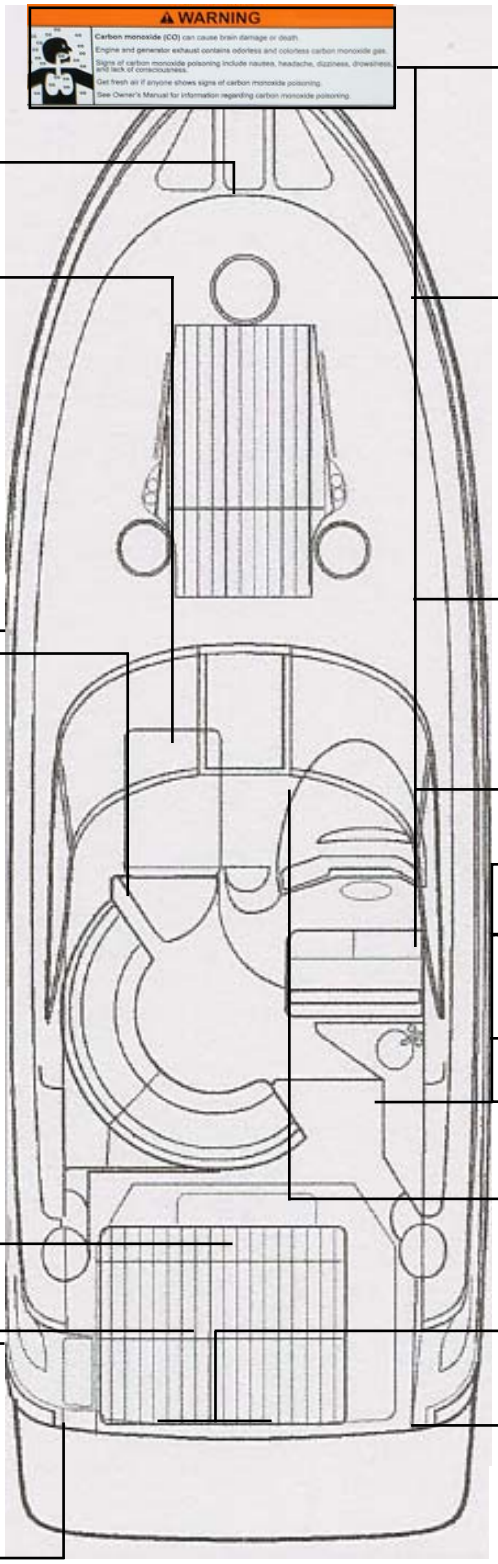
WARNING!
SECURE DOOR WHEN CRUISING
DO NOT SIT, STAND, OR PLACE, HEAVY OBJECTS ON DOOR.
KEEP CABIN DOOR CLOSED WHEN ENGINES OR GENERATOR ARE RUNNING.

Discharging of waste within the 3 mile U.S. coastal limit is prohibited by federal law. Shut off valve must be secured closed within U.S. Waters.

DISCHARGE OF OIL PROHIBITED
THE FEDERAL WATER POLLUTION CONTROL ACT PROHIBITS THE DISCHARGE OF OIL OR OILY WASTE INTO OR UPON THE NAVIGABLE WATERS AND CONTIGUOUS ZONE OF THE UNITED STATES IF SUCH DISCHARGE CAUSES A FILM OR SHEEN UPON, OR DISCOLORATION OF, THE SURFACE OF THE WATER, OR CAUSES A SLUDGE OR EMULSION BENEATH THE SURFACE OF THE WATER.
VIOLATORS ARE SUBJECT TO A PENALTY OF $5,000

SLING

⚠ WARNING
To minimize shock and fire hazards:
(1) Turn off the boat's shore connection switch before connecting or disconnecting shore cable.
(2) Connect shore-power cable at the boat first.
(3) If polarity warning indicator is activated, immediately disconnect cable.
(4) Close shore-power inlet cover tightly.
DO NOT ALTER SHORE-POWER CABLE CONNECTORS


⚠ WARNING
Carbon monoxide (CO) can cause brain damage or death.
Engine and generator exhaust contains odorless and colorless carbon monoxide gas.
Signs of carbon monoxide poisoning include nausea, headache, dizziness, drowsiness and lack of consciousness.
Get fresh air if anyone shows signs of carbon monoxide poisoning.
See Owner's Manual for information regarding carbon monoxide poisoning.

WARNING
GASOLINE VAPORS CAN EXPLODE BEFORE STARTING ENGINE. OPERATE BLOWER 4 MIN. AND CHECK ENGINE COMPARTMENT FOR GASOLINE LEAKS OR VAPORS. RUN BLOWER BELOW CRUISING SPEED.
4 MIN.

WARNING
TRANSOM DOOR MUST BE CLOSED AND SECURE WHEN ENGINE IS RUNNING

YACHT CERTIFICATION
DESIGN COMPLIANCE WITH NMMA REQUIREMENTS IN EFFECT ON THE DATE OF CERTIFICATION IS VERIFIED. MANUFACTURER RESPONSIBLE FOR PRODUCTION CONTROL.
NATIONAL MARINE MANUFACTURERS ASSOCIATION
THIS BOAT COMPLIES WITH U.S. COAST GUARD SAFETY STANDARDS IN EFFECT ON THE DATE OF CERTIFICATION
REGAL MARINE IND. ORLANDO, FL

POWER SWITCH AT BOW ANCHOR WINDLASS MUST BE IN OFF POSITION WHEN NOT IN USE.

THE DISCHARGE OF PLASTIC OR GARBAGE MIXED WITH PLASTIC INTO ANY WATERS IS **PROHIBITED**. THE DISCHARGE OF ALL GARBAGE IS **PROHIBITED** IN THE NAVIGABLE WATERS OF THE UNITED STATES AND, IN ALL OTHER WATERS, WITHIN THREE NAUTICAL MILES OF THE NEAREST LAND.

THE DISCHARGE OF DUNNAGE, LINING, AND PACKING MATERIALS THAT FLOAT IS PROHIBITED WITHIN 25 NAUTICAL MILES FROM THE NEAREST LAND.	OTHER UNGROUND GARBAGE MAY BE DISCHARGED BEYOND 12 NAUTICAL MILES FROM THE NEAREST LAND.	OTHER GARBAGE GROUND TO LESS THAN ONE INCH MAY BE DISCHARGED BEYOND THREE NAUTICAL MILES OF THE NEAREST LAND.

A PERSON WHO VIOLATES THE ABOVE REQUIREMENTS IS LIABLE FOR A CIVIL PENALTY OF UP TO $25,000, A FINE OF UP TO $50,000, AND IMPRISONMENT FOR UP TO FIVE YEARS FOR EACH VIOLATION. REGIONAL, STATE, AND LOCAL RESTRICTIONS ON GARBAGE DISCHARGES ALSO MAY APPLY.

⚠ WARNING
Carbon monoxide (CO) can cause brain damage or death.
Carbon monoxide can be present in the cabin.
Signs of carbon monoxide poisoning include nausea, headache, dizziness, drowsiness, and lack of consciousness.
Get fresh air if anyone shows signs of carbon monoxide poisoning.
Get fresh air if carbon monoxide detector alarm sounds.
Carbon monoxide detector must be functioning at all times.

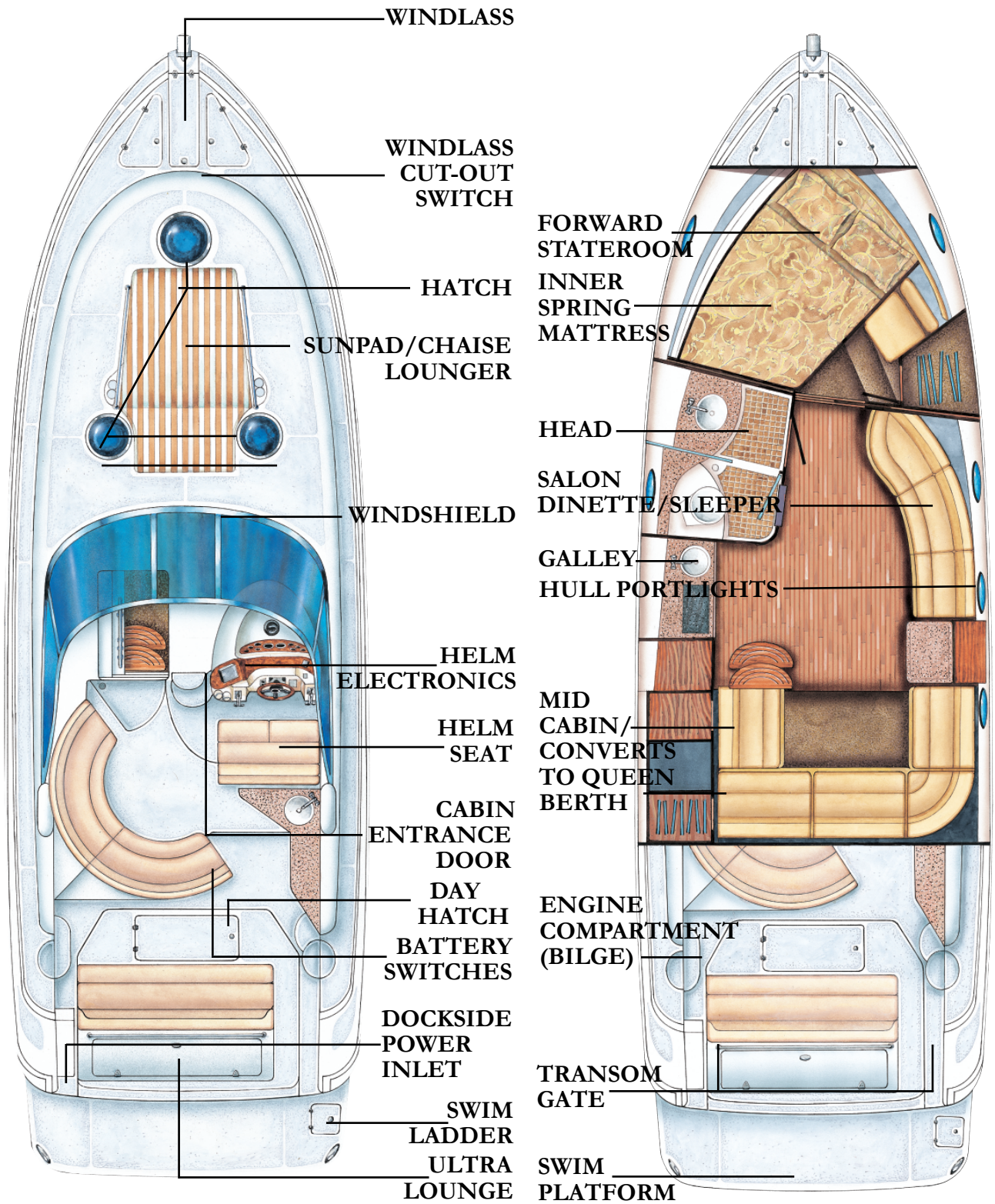
WARNING
LEAKING FUEL IS A FIRE AND EXPLOSION HAZARD. INSPECT SYSTEM REGULARLY. EXAMINE FUEL SYSTEM FOR LEAKS OR CORROSION AT LEAST ANNUALLY.

⚠ DANGER
Carbon monoxide (CO) can cause brain damage or death.
Engine and generator exhaust contains odorless and colorless carbon monoxide gas.
Carbon monoxide will be around the back of the boat when engines or generators are running.
Move to fresh air, if you feel nausea, headache, dizziness, or drowsiness.

*Note-Drawing Not To Scale
Label Location Is Subject To Change

38 EXPRESS SPECIFICATIONS		
LENGTH OVERALL W/ EXT.PLATFORM	USA 38’	CE 11.6 M
BEAM	12’ 2”	3.8 M
DEADRISE	19 DEGREES	
APPROXIMATE DRY WEIGHT	15,200 LBS.	6895.0 KG
APPROXIMATE BRIDGE CLEARANCE TO TOP OF RADAR	12’ 4”	2.1 CU. M
CABIN STORAGE	75 CU. FT.	2.1 CU. M
COCKPIT STORAGE	83 CU. FT.	2.3 CU. M
APPROXIMATE DRAFT-HIGH TRIM	22”	0.5 M
APPROXIMATE DRAFT-DRIVE DOWN	36”	0.9 M
FUEL CAPACITY	276 GALS	1045 L
WATER CAPACITY *	67 GALS	253 L
WASTE CAPACITY *	30 GALS	114 L
PERSONS CAPACITY	YACHT CERTIFIED	10
MAXIMUM LOAD RECOMMENDED; PERSONS & GEAR		1121 KG

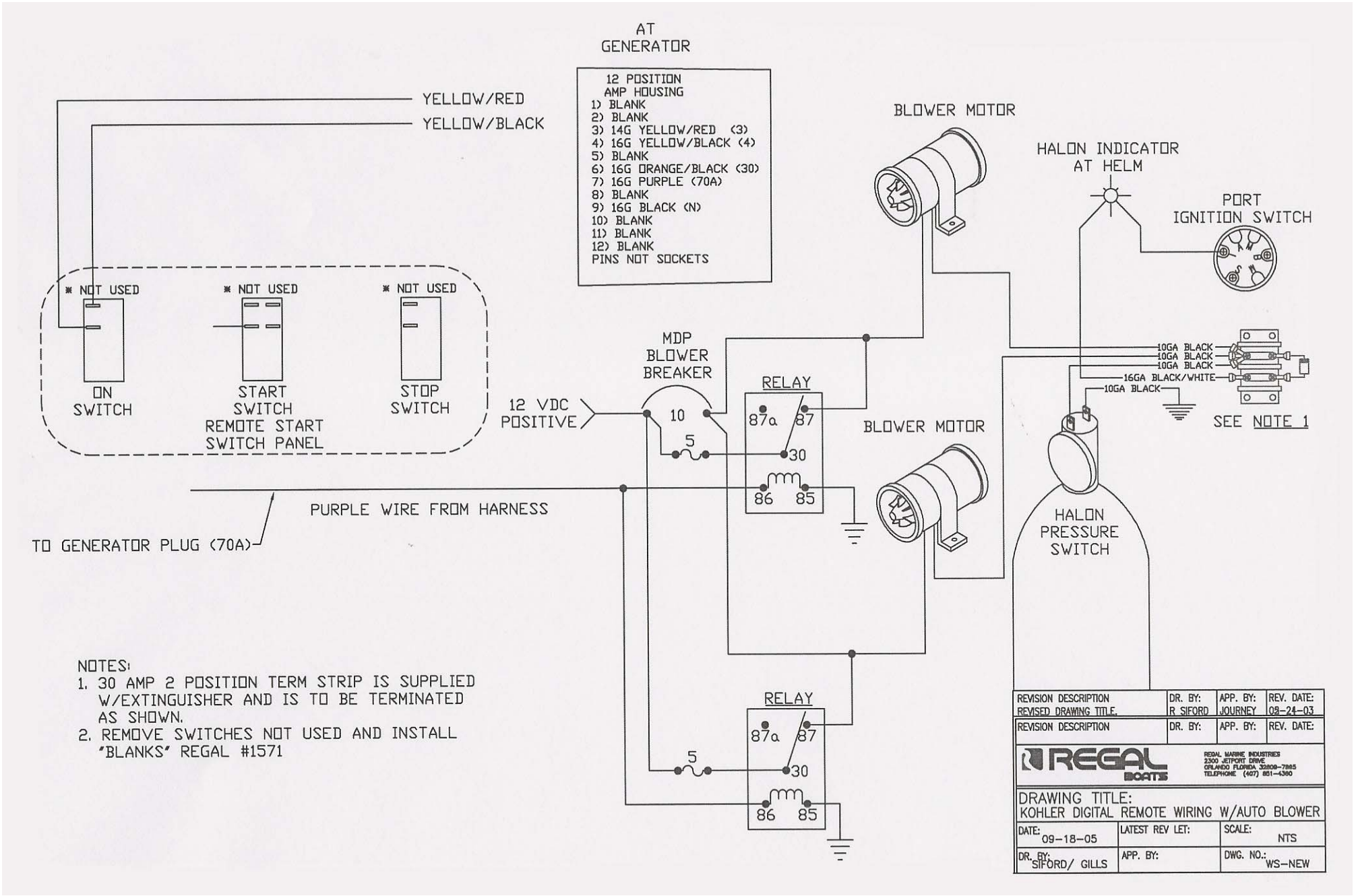
38 EXPRESS DECK/CABIN FEATURES



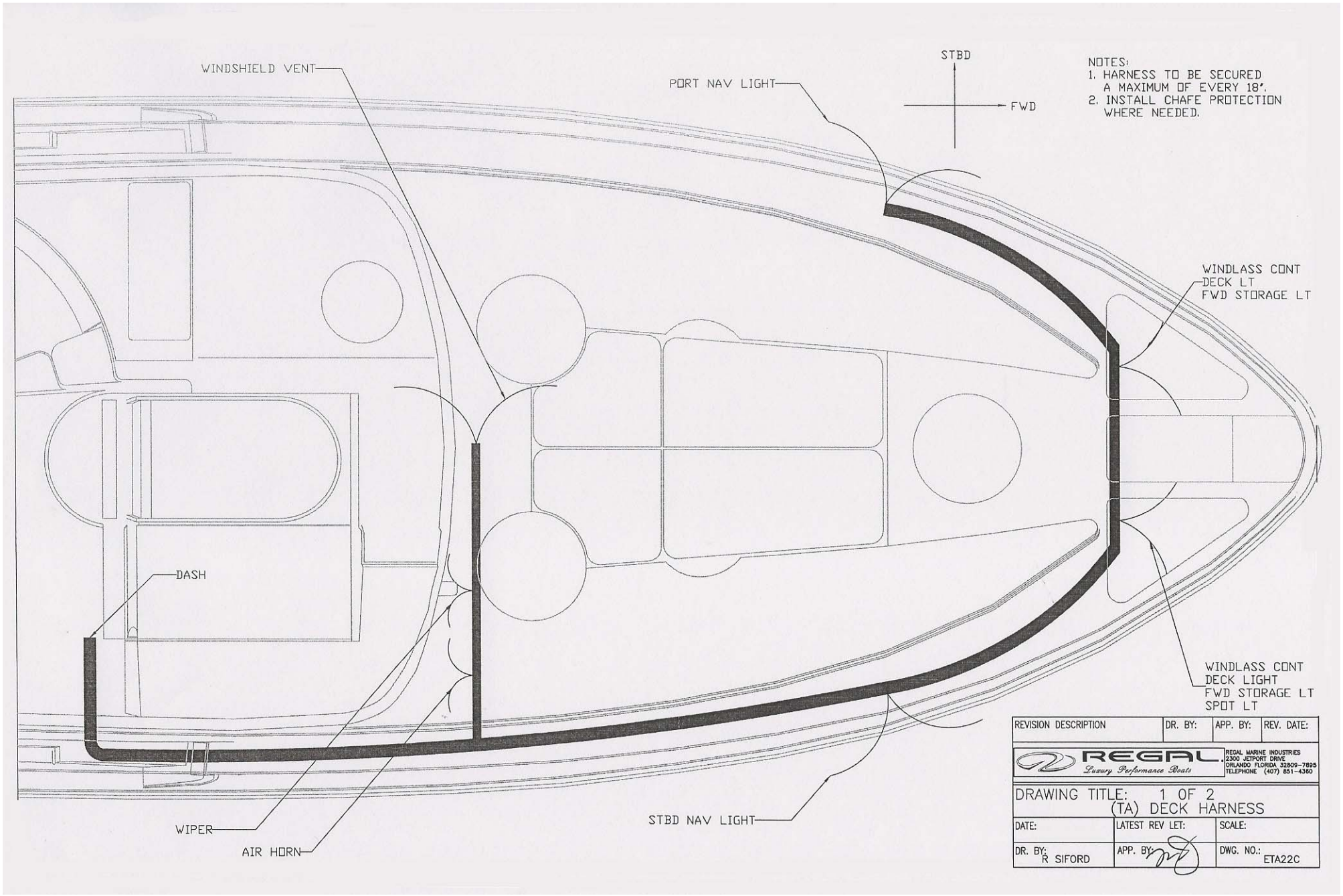
*NOTE: NOT TO SCALE/SELECT FEATURES SHOWN

TECHNICAL DRAWINGS

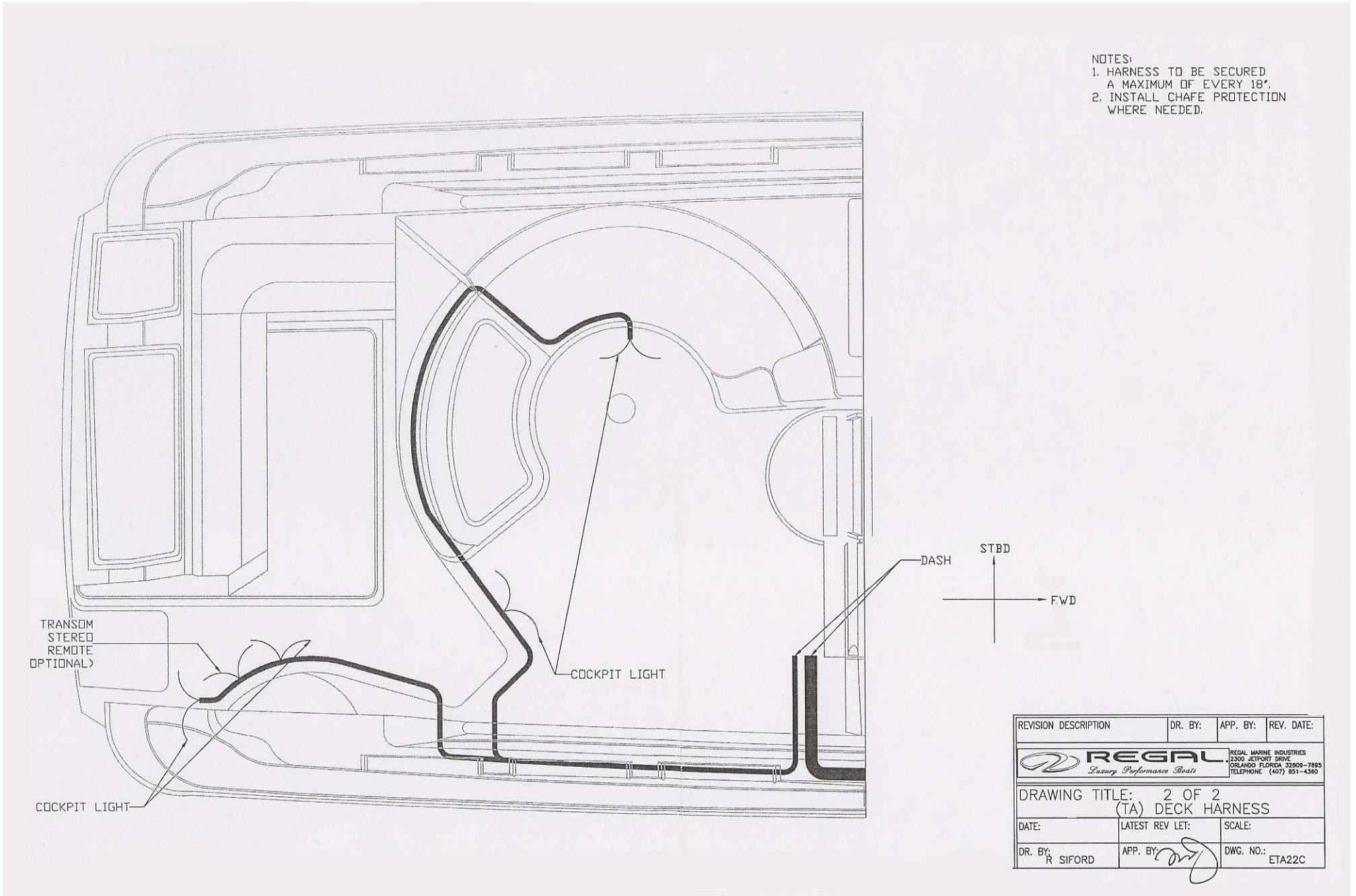
***NOTE: THE FOLLOWING DRAWING SECTION CONSISTS OF ELECTRICAL AND MECHANICAL INFORMATION. THE DRWING INFORMATION IS SUBJECT TO CHANGE AT ANY TIME AS REGAL IS CONSTANTLY UPDATING EQUIPMENT, VENDORS AND MANUFACTURING PROCESSES TO PRODUCE A BEST IN CLASS PRODUCT. THE LAYOUTS SHOWN ARE TYPICAL AND MAY NOT REPRESENT EXACT WIRING SCHEMATICS .**



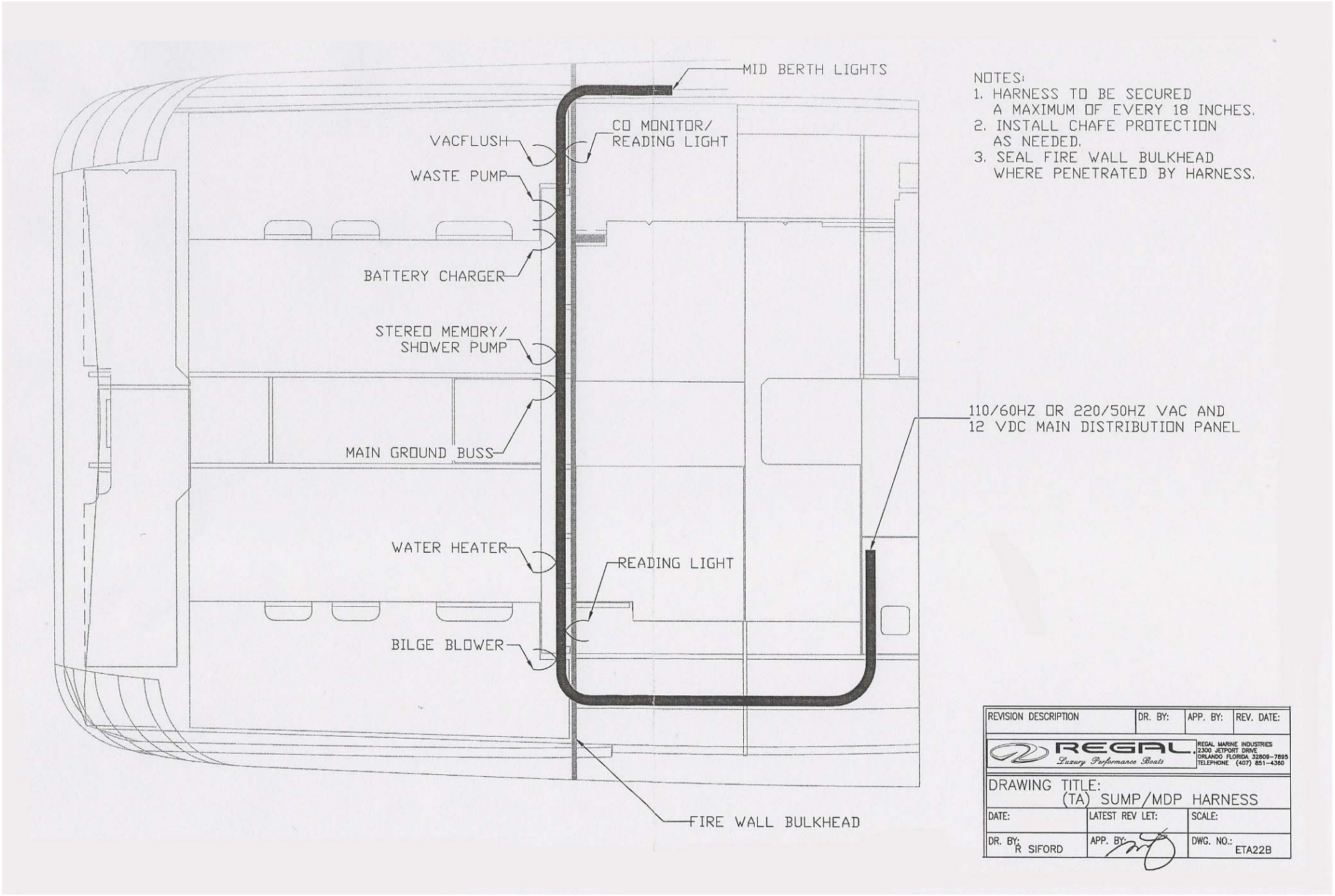
38 EXPRESS TYPICAL KOHLER GENERATOR W/ DIGITAL REMOTE WIRING



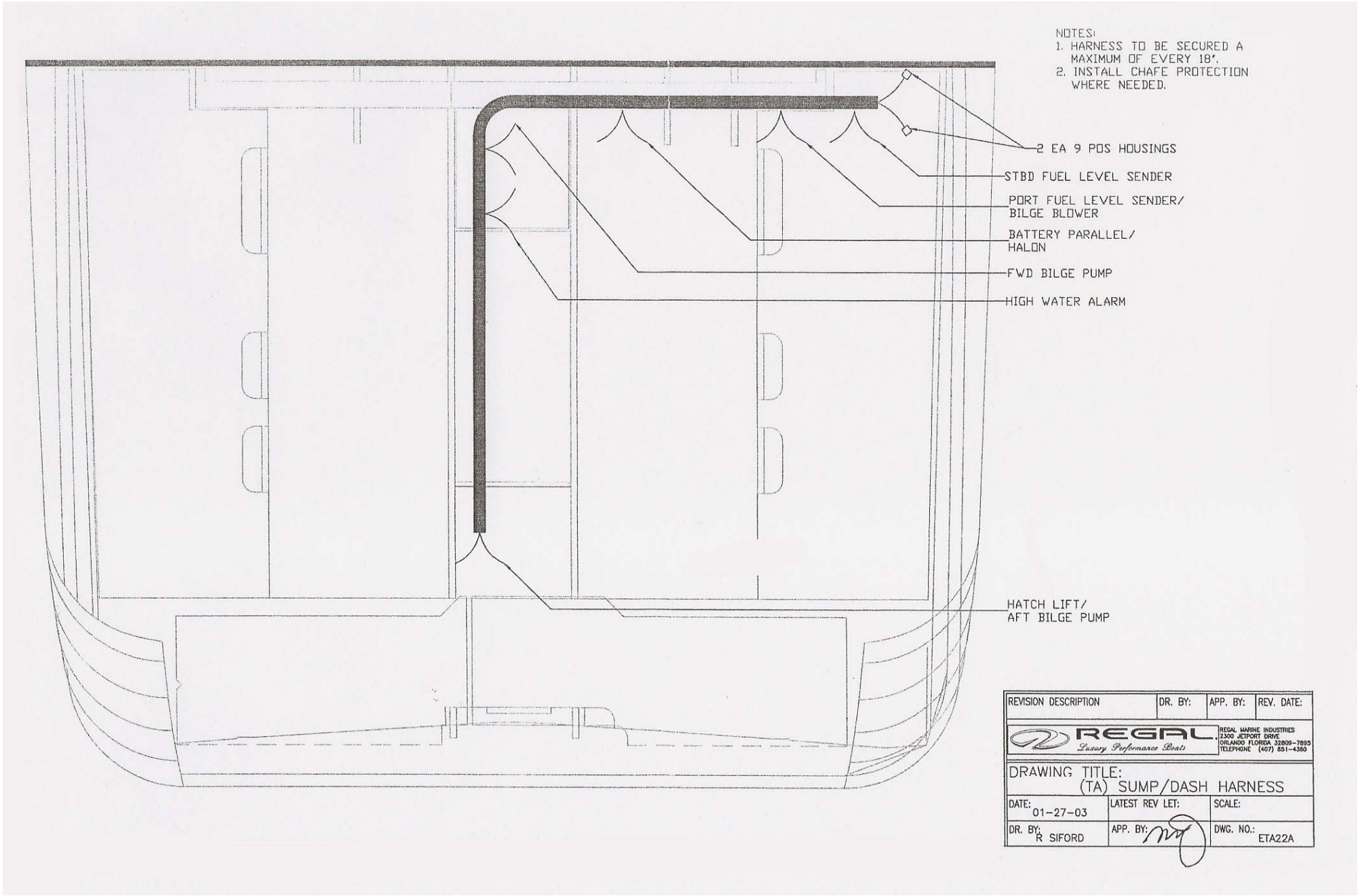
38 EXPRESS TYPICAL DECK HARNESS 1 OF 2



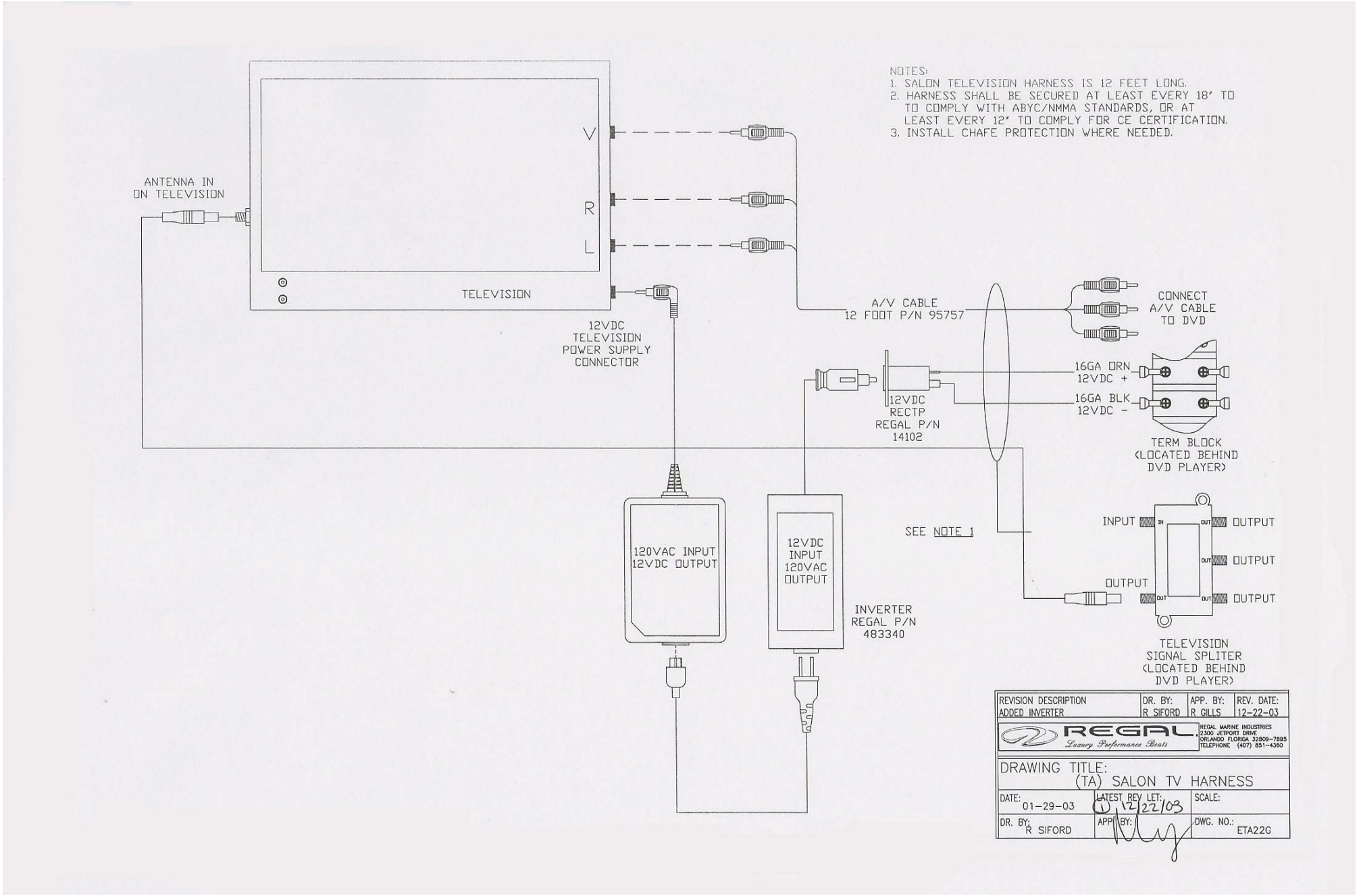
38 TYPICAL DECK HARNESS 2 OF 2



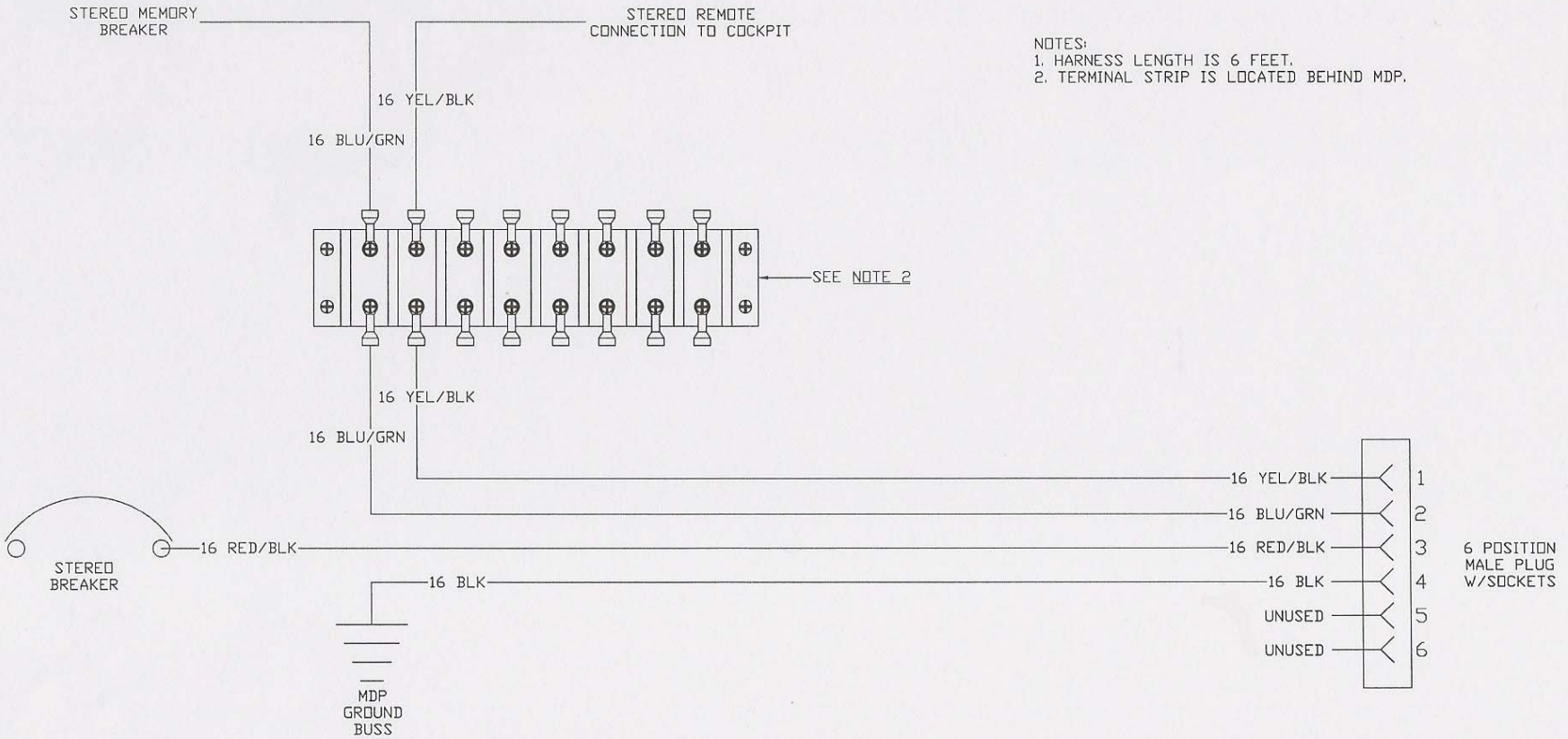
38 EXPRESS TYPICAL SUMP/ MAIN DISTRIBUTION PANEL HARNESS



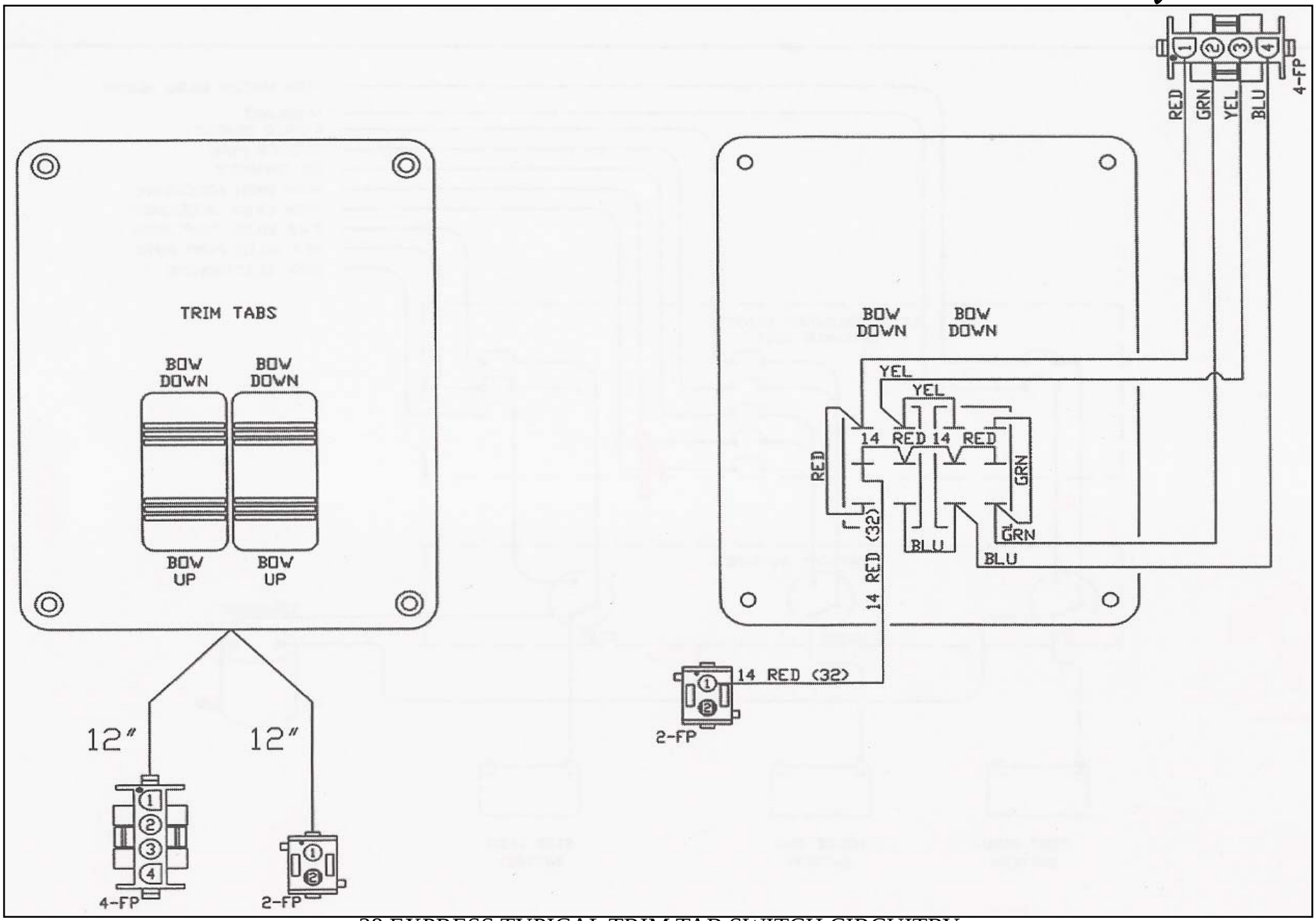
38 EXPRESS TYPICAL SUMP/DASH HARNESS


NOTES:
1. SALON TELEVISION HARNESS IS 12 FEET LONG.
2. HARNESS SHALL BE SECURED AT LEAST EVERY 18" TO TO COMPLY WITH ABYC/NMMA STANDARDS, OR AT LEAST EVERY 12" TO COMPLY FOR CE CERTIFICATION.
3. INSTALL CHAFE PROTECTION WHERE NEEDED.
ANTENNA IN ON TELEVISION
V
R
L
TELEVISION
12VDC TELEVISION POWER SUPPLY CONNECTOR
A/V CABLE 12 FOOT P/N 95757
CONNECT A/V CABLE TO DVD
16GA ORN 12VDC +
16GA BLK 12VDC -
12VDC RECTP REGAL P/N 14102
TERM BLOCK (LOCATED BEHIND DVD PLAYER)
120VAC INPUT 12VDC OUTPUT
12VDC INPUT 120VAC OUTPUT
INVERTER REGAL P/N 483340
SEE NOTE 1
INPUT
OUTPUT
OUTPUT
OUTPUT
OUTPUT
TELEVISION SIGNAL SPLITER (LOCATED BEHIND DVD PLAYER)
REVISION DESCRIPTION
ADDED INVERTER
DR. BY: R SIFORD
APP. BY: R GILLS
REV. DATE: 12-22-03
REGAL Luxury Performance Boats
REGAL MARINE INDUSTRIES 2300 JETPORT DRIVE ORLANDO FLORIDA 32809-7895 TELEPHONE (407) 851-4360
DRAWING TITLE:
(TA) SALON TV HARNESS
DATE: 01-29-03
LATEST REV LET: (1) 12/22/03
SCALE:
DR. BY: R SIFORD
APP. BY:
DWG. NO.: ETA22G

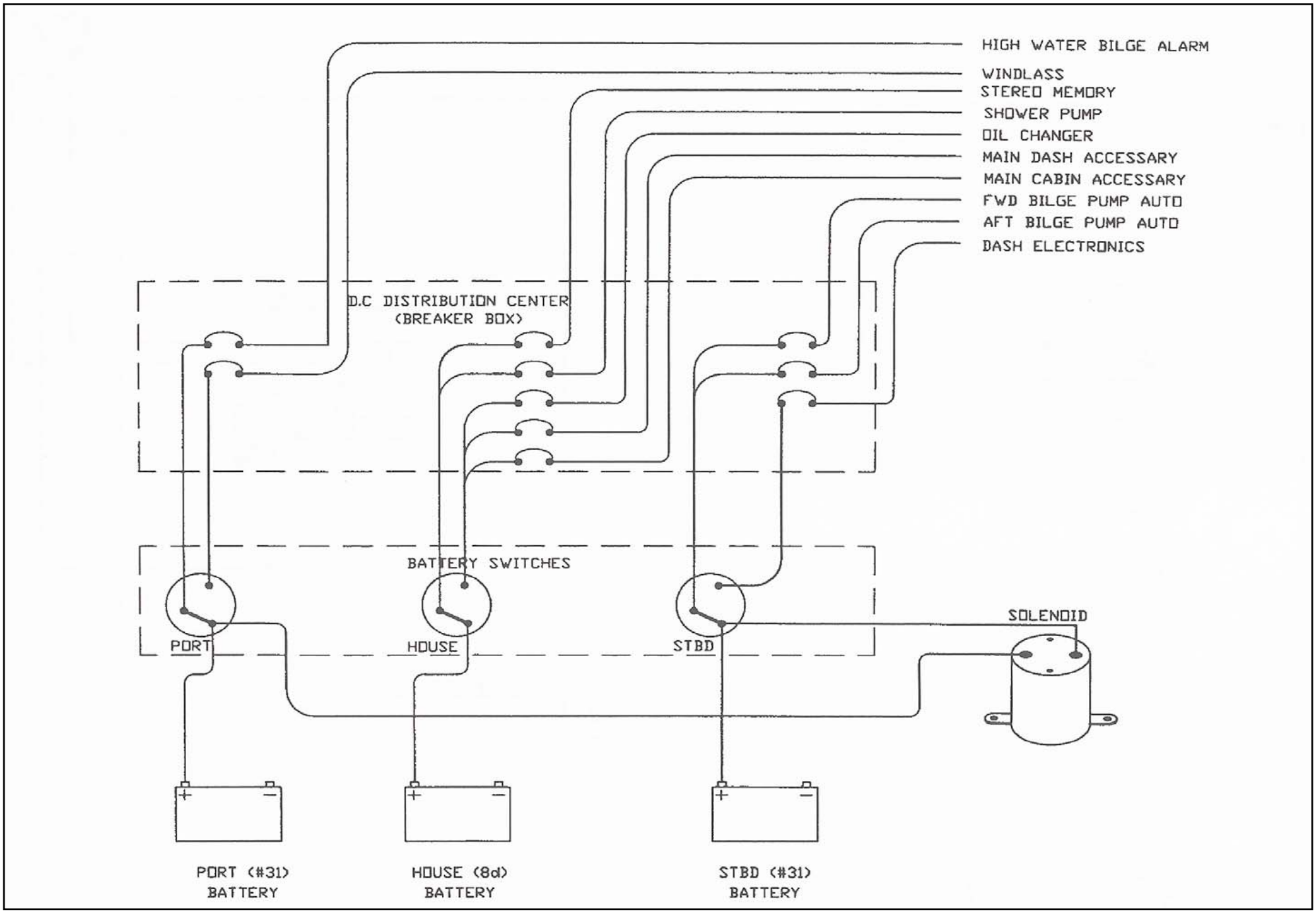
38 EXPRESS TYPICAL SALON TV HARNESS



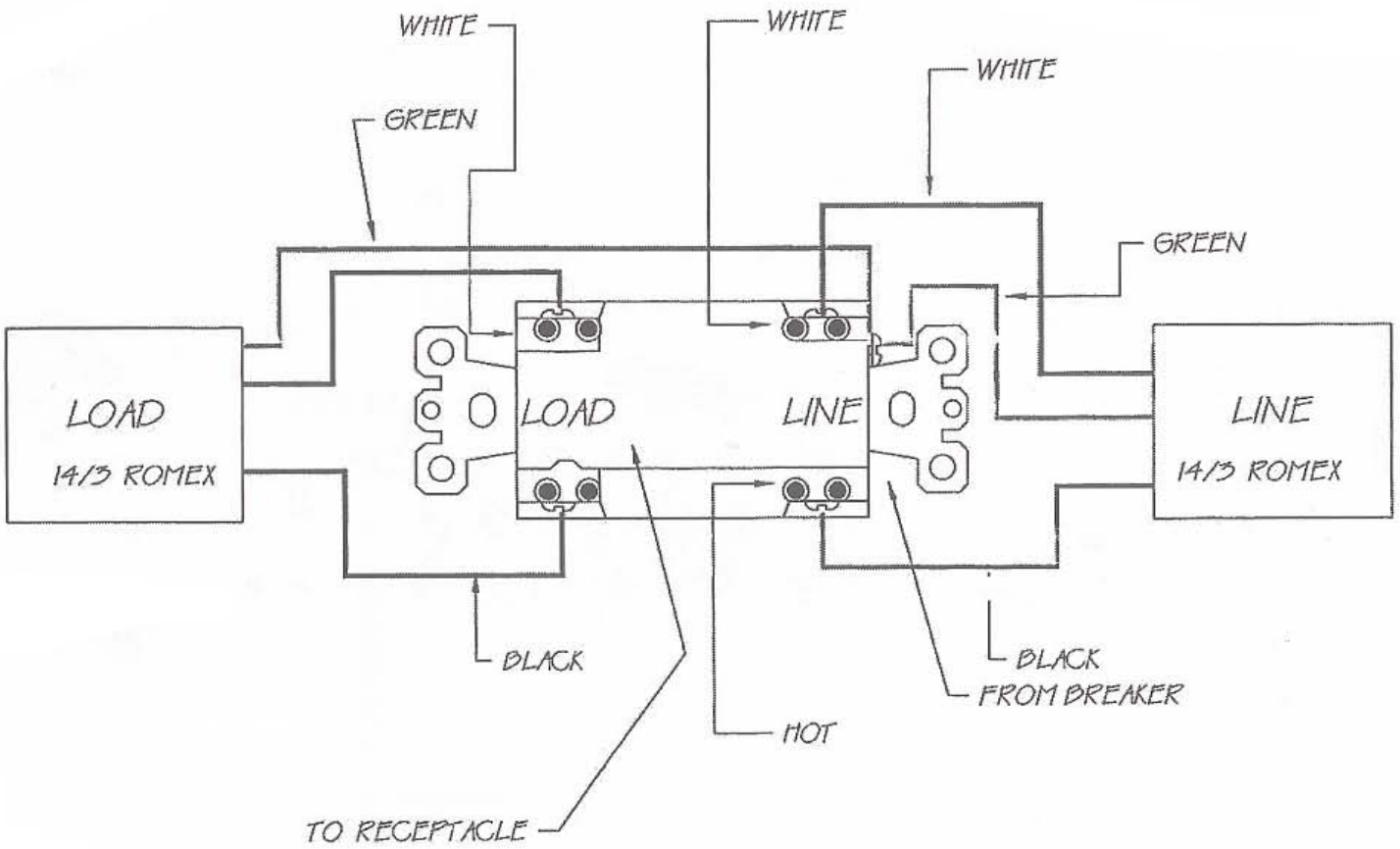
38 EXPRESS TYPICAL STEREO HARNESS



38 EXPRESS TYPICAL TRIM TAB SWITCH CIRCUITRY



38 EXPRESS TYPICAL BATTERY SWITCH CIRCUITRY



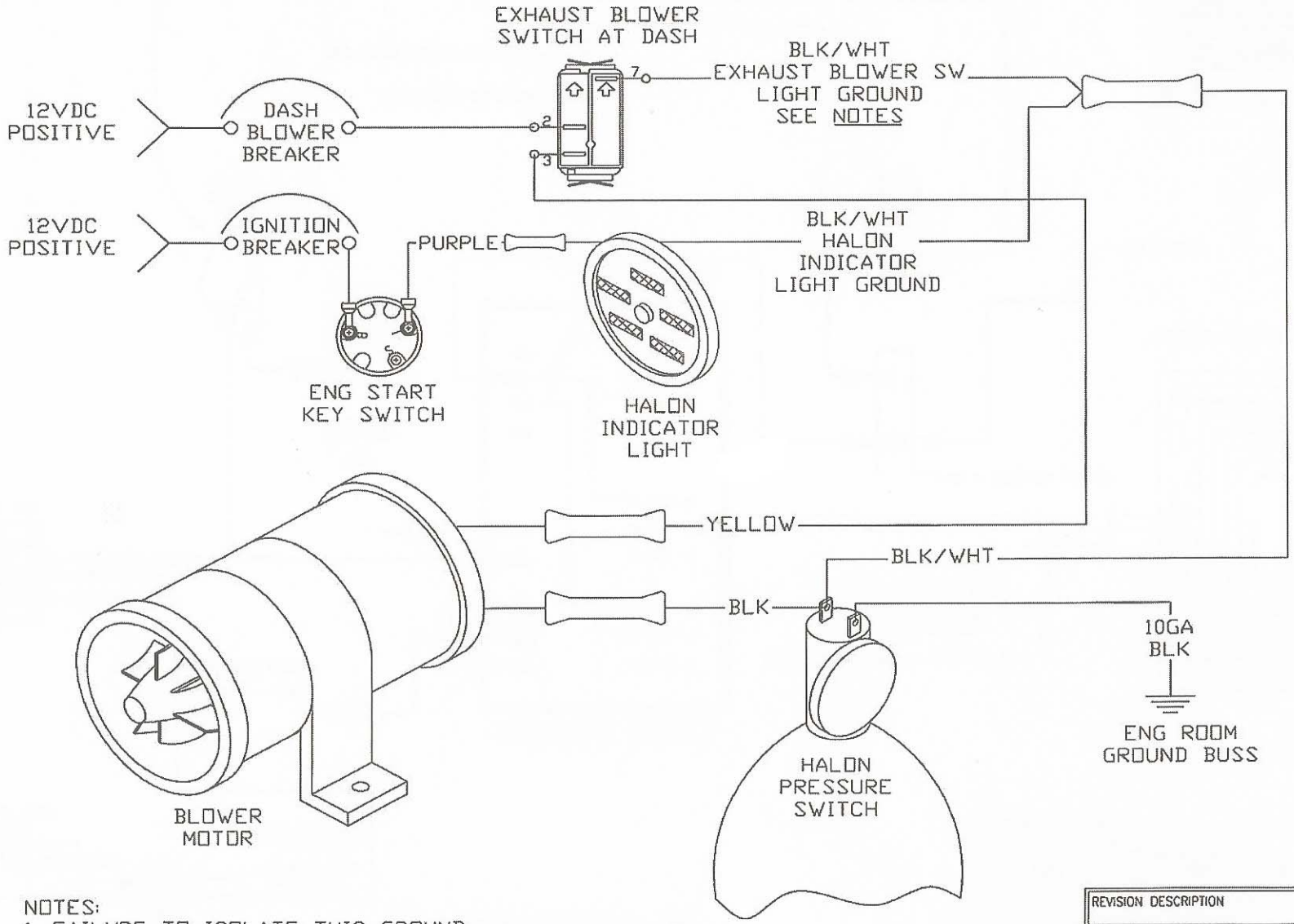
REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:

REGAL BOATS
REGAL MARINE INDUSTRIES
2300 JETPORT DRIVE
ORLANDO FLORIDA 32809-7899
TELEPHONE (407) 851-4360

DRAWING TITLE:
110 VOLT GROUND FAULT CIRCUIT INTERUPTER

DATE:	LATEST REV LET:	SCALE:
DR. BY:	APP. BY:	DWG. NO.:

38 EXPRESS TYPICAL GFCI CIRCUITRY



NOTES:
1. FAILURE TO ISOLATE THIS GROUND WILL RESULT IN AN UNDESIRABLE OPERATION OF THE HALON EXTINGUISHER INDICATOR LIGHT.
2. FAILURE TO ISOLATE THIS GROUND WILL RESULT IN AN UNDESIRABLE OPERATION OF THE DIESEL SHUTDOWN SYSTEM.

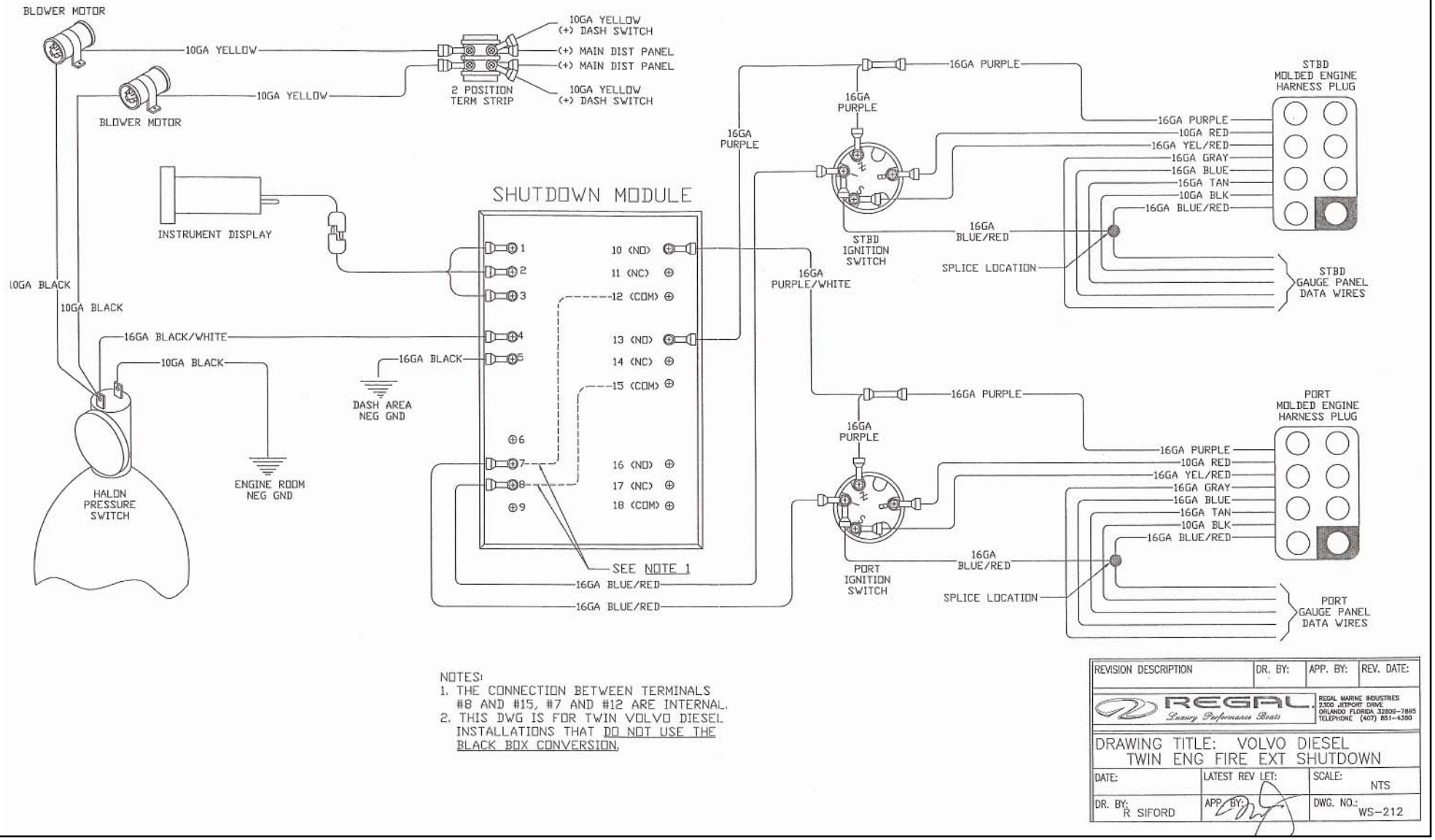
REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:

REGAL MARINE INDUSTRIES
2300 JETPORT DRIVE
ORLANDO FLORIDA 32809-7895
TELEPHONE (407) 851-4360

DRAWING TITLE:
FIRE EXTINGUISHER SYSTEM GROUND

DATE:	LATEST REV NUMBER:
DR. BY:	DWG. NO.:

38 EXPRESS TYPICAL FIRE EXTINGUISHER GROUND CIRCUITRY



NOTES:
1. THE CONNECTION BETWEEN TERMINALS #8 AND #15, #7 AND #12 ARE INTERNAL.
2. THIS DWG IS FOR TWIN VOLVO DIESEL INSTALLATIONS THAT DO NOT USE THE BLACK BOX CONVERSION.

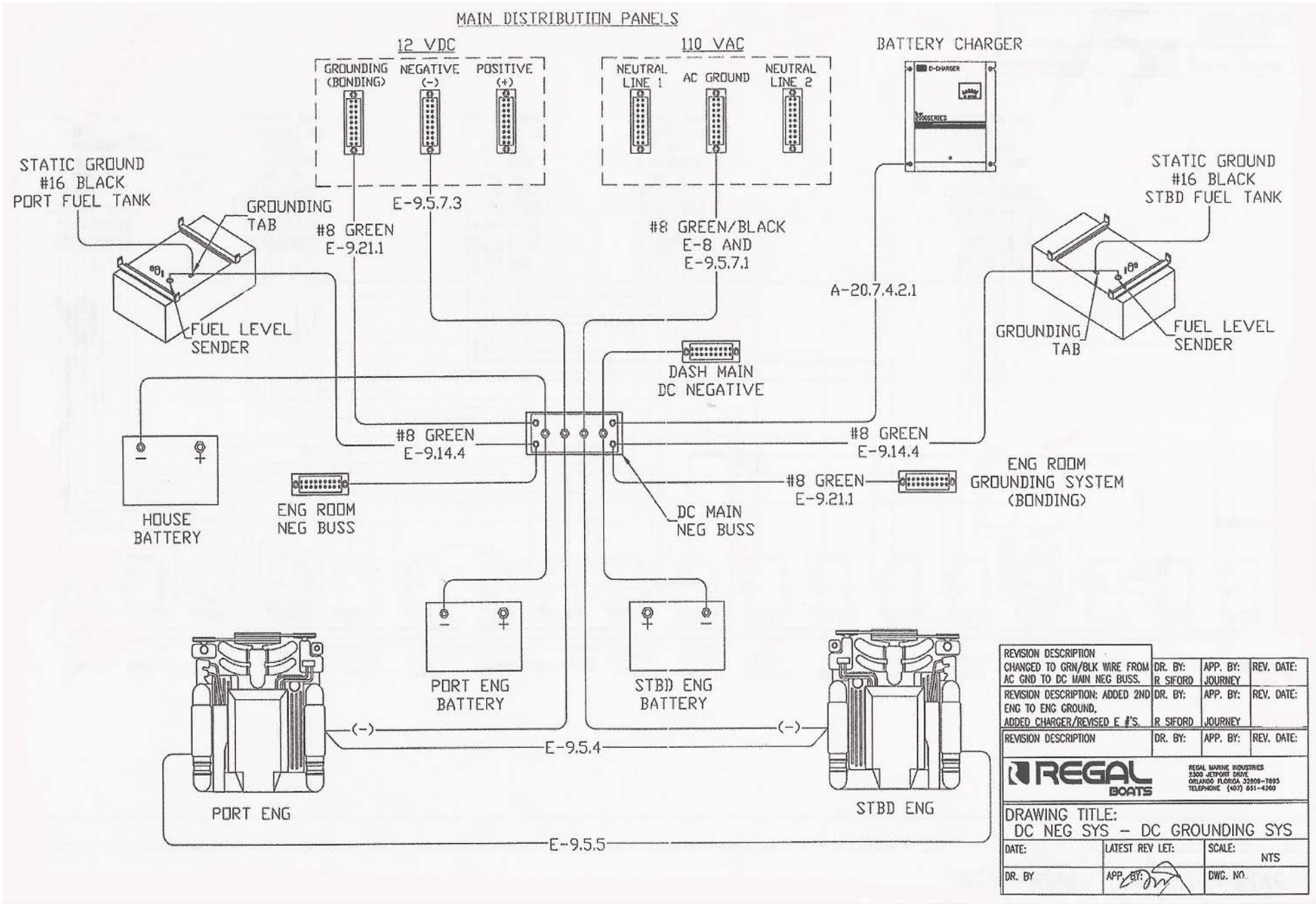
REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:

REGAL Luxury Performance Boats
REGAL MARINE INDUSTRIES
2300 JETPORT DRIVE
ORLANDO FLORIDA 32809-7895
TELEPHONE (407) 851-4360

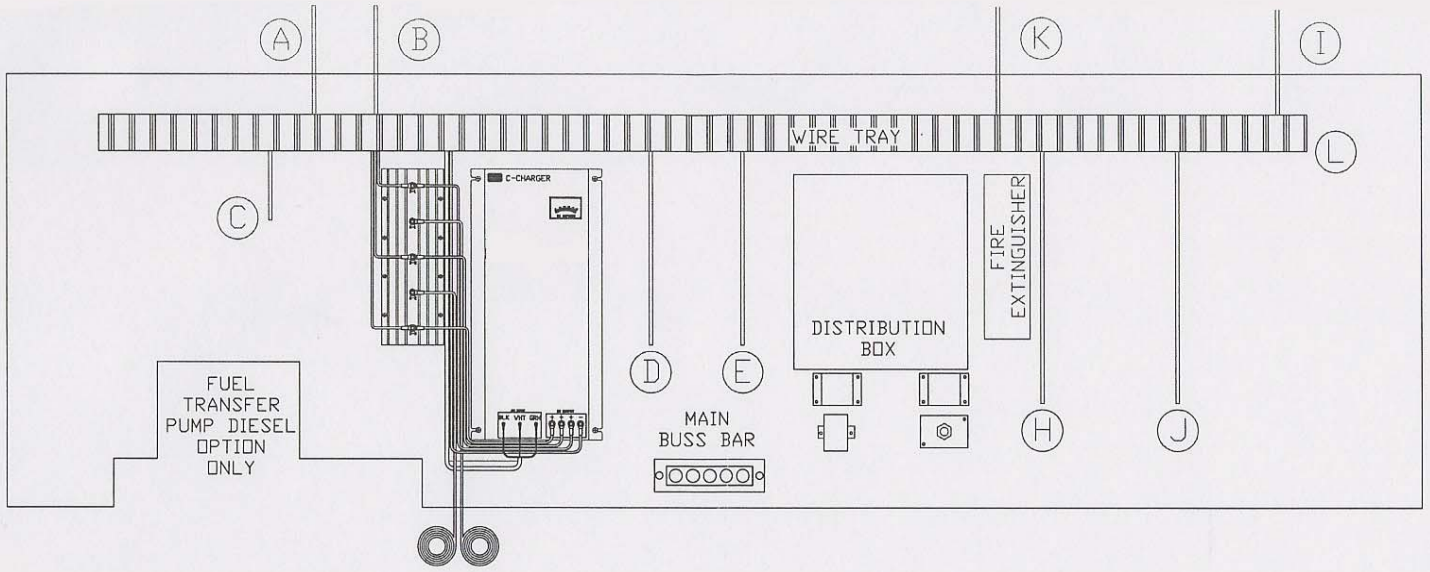
DRAWING TITLE: VOLVO DIESEL TWIN ENG FIRE EXT SHUTDOWN

DATE:	LATEST REV LET:	SCALE: NTS
DR. BY: R SIFORD	APP. BY:	DWG. NO.: WS-212

38 EXPRESS TYPICAL TWIN VOLVO DIESEL ENGINE FIRE EXT. SHUTDOWN



38 EXPRESS TYPICAL BATTERY SWITCH CIRCUITRY



A
ENEINE ROOM LIGHT
ENGINE ROOM LIGHT

B
3/4" SPLIT FLEX
CO DETECTOR
CABIN LIGHTS

C
BUSS BAR

D
BOND
BOND
BUSS GROUND

E
ALL @ RIGHT SIDE
MAIN BUSS
MAIN BUSS

F
OPTION
STERED AMP-RED/VIOLET

G
STERED MEMORY-16 YELLOW/RED
AFT BILGE PUMP-16 BROWN/RED
FWD BLGE PUMP-16 BROWN/RED
16 BROWN/BLACK

H
PARALLEL SOLENOID-16 BLACK
PARALLEL SOLENOID-14 RED/WHITE

I
1/2" SPLIT FLEX
ENG ROOM LIGHT
ENG ROOM LIGHT

J
FIRE EXTINGUISHER-10 BLACK
FIRE EXTINGUISHER-10 BLACK
MARKED-10 BLACK
16 BLACK/WHITE

K
MID CABIN LIGHT
MID CABIN LIGHT

L
MID CABIN LIGHT
MID CABIN LIGHT

REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:

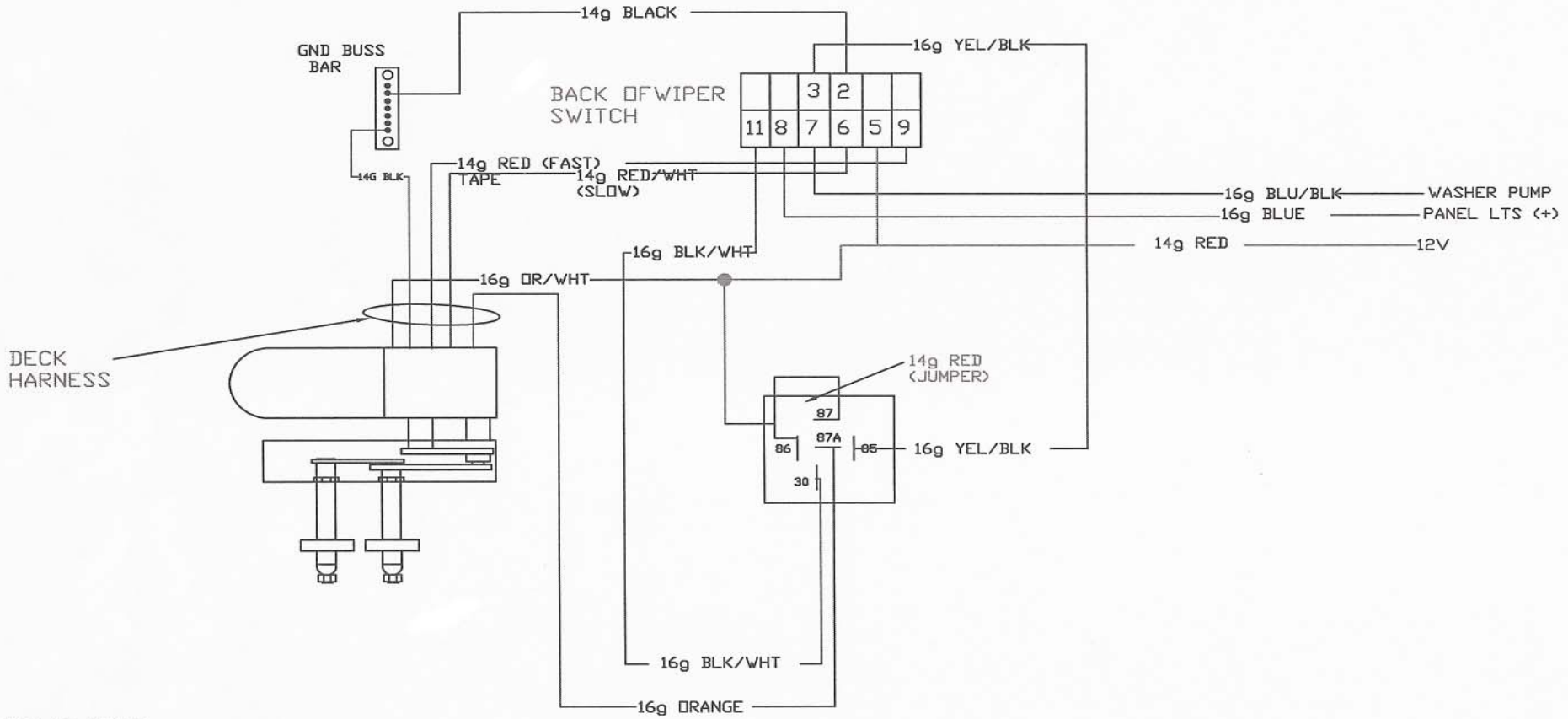
REGAL
Luxury Performance Boats

REGAL MARINE INDUSTRIES
2300 JETPORT DRIVE
ORLANDO FLORIDA 32809-7895
TELEPHONE (407) 851-4360

DRAWING TITLE: 1 OF 2
(TA) FIRE WALL WIRING

DATE:	LATEST REV LET:	SCALE:
DR. BY: R SIFORD	APP. BY:	DWG. NO.: ETA22L

38 EXPRESS TYPICAL FIREWALL WIRING



WIRING AT WIPER:
BLACK HARNESS TO BLACK WIPER
RED WHITE HARNESS TO BLUE/YEL WIPER
ORANGE HARNESS TO BLUE/BLK WIPER
ORANGE/WHT HARNESS TO BLUE/RED WIPER
RED HARNESS TO BLUE WIPER

WIPER WIRING CODE ON WIPER PLUG:
BLACK = "GROUND"
BLUE/BLK = "SWITCH"
BLUE/RED = "PARK"
BLUE = "FAST"
BLUE/GRN = "SLOW"

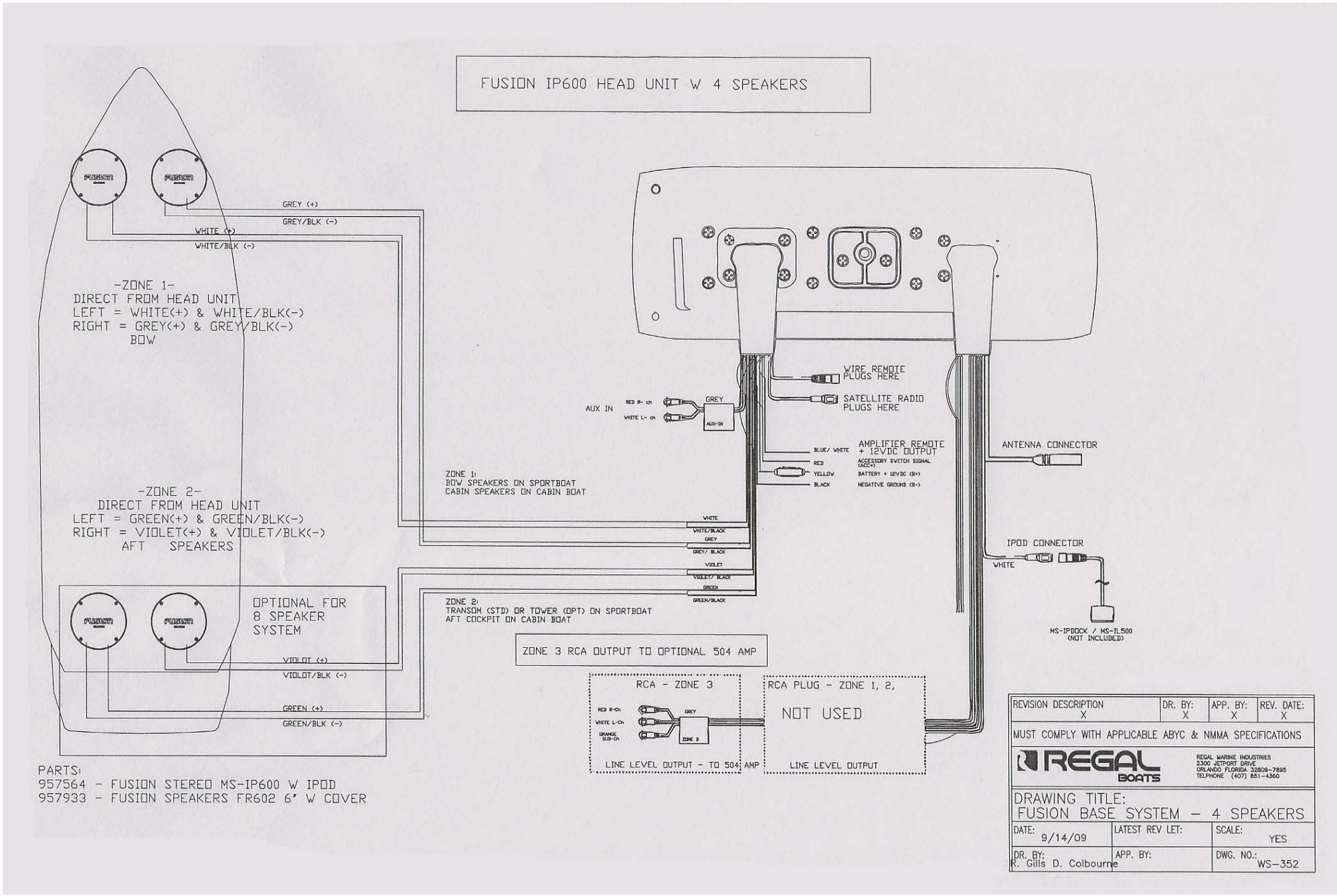
REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:

REGAL MARINE INDUSTRIES
2300 JETPORT DRIVE
ORLANDO FLORIDA 32809-7895
TELEPHONE (407) 851-4360

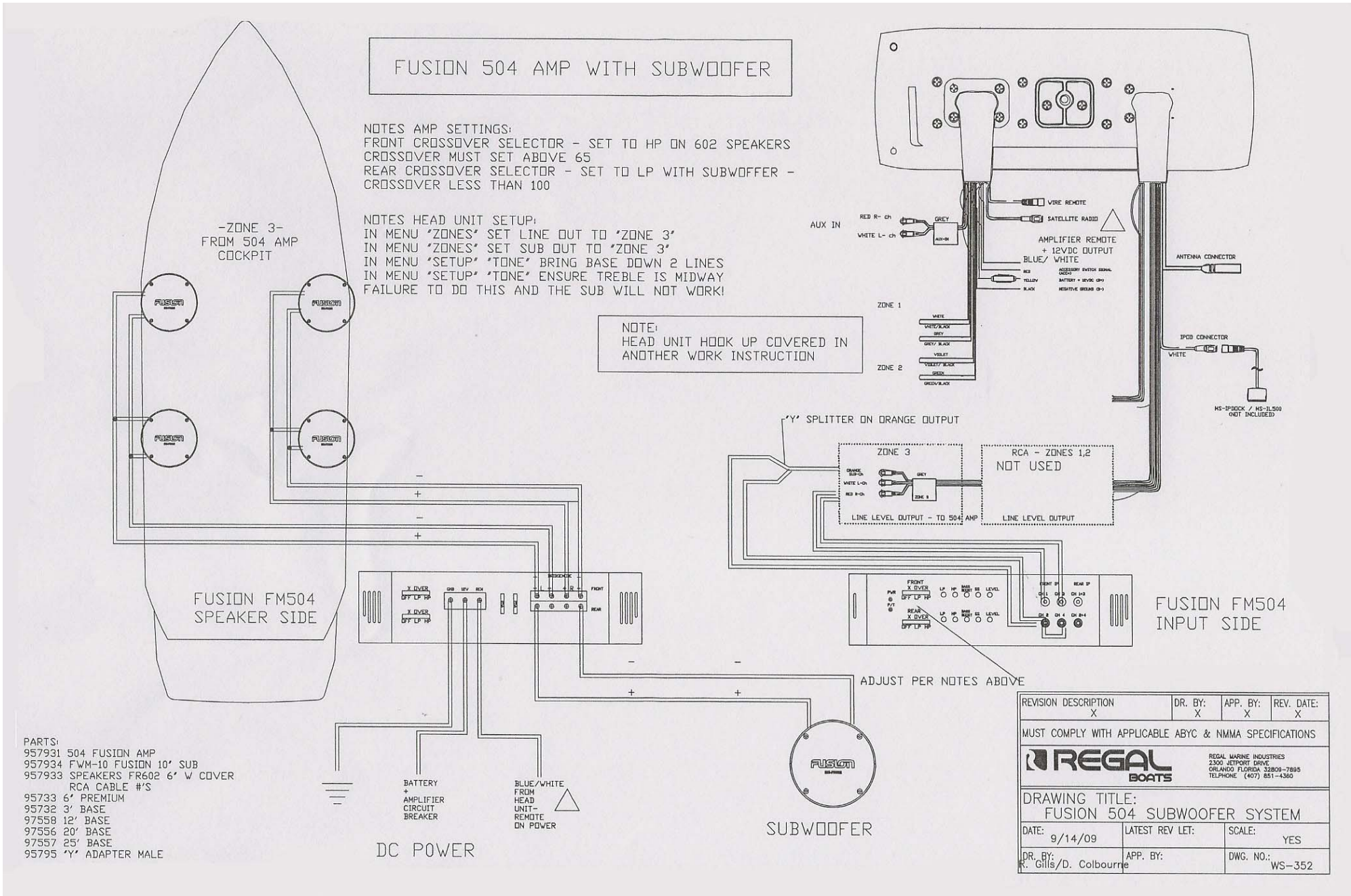
DRAWING TITLE: WIPER SWITCH WIRING

DATE: 1/29/09	CHECK BY:	PAGE NO. : 1 OF 1
DR. BY: M. GARCIA/R. GILLS	APP. BY: R. GILLS	DWG. NO.: WI- 872

38 EXPRESS TYPICAL WIPER CIRCUITRY OVERVIEW



38 EXPRESS TYPICAL FUSION INSTALLATION



38 EXPRESS TYPICAL FUSION SUB WOOFER INSTALLATION

ZONE LAYOUTS BY MODEL AND OPTION

STANDARD CONFIGURATION:
1900 "BM" HEAD UNIT ONLY - 4 SPEAKERS ZONE 1 COCKPIT FWD, ZONE 2 COCKPIT AFT
SPORT BOAT - ZONE 1 BOW, ZONE 2 TRANSOM, ZONE 3 COCKPIT & SUB
2565 TO 38 EX - ZONE 1 CABIN SPEAKERS, ZONE 2 COCKPIT SPEAKERS & SUBWOOFER
4060 TO 5260 - HEAD UNIT ONLY ZONE 1 HARDTOP SPEAKERS, ZONE 2 AFT SPEAKERS

UPGRADE OPTIONS:
1900 "BM" NO UPGRADES
SPORT BOAT WITH TOWER - ZONE 1 BOW, ZONE 2 TOWER, ZONE 3 COCKPIT & SUB
2565 TO 38 EX - NO UPGRADES
4080 - NO UPGRADES
4060 TO 5260 - SUBWOOFER UPGRADE ZONE 1 HARDTOP SPEAKERS & SUBWOFFER, ZONE 2 AFT SPEAKERS

REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:
X	X	X	X

MUST COMPLY WITH APPLICABLE ABYC & NMMA SPECIFICATIONS

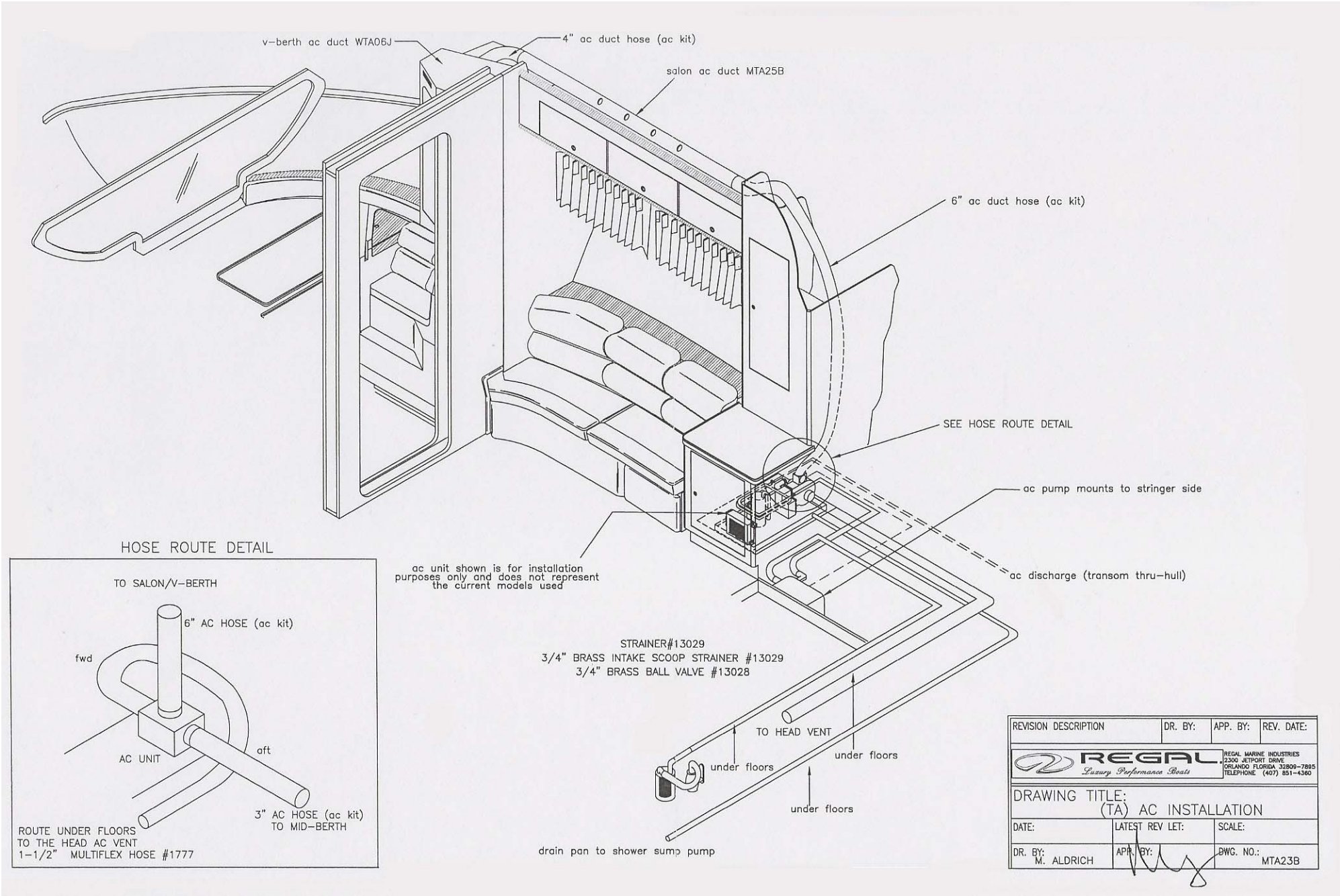
REGAL BOATS

REGAL MARINE INDUSTRIES
2300 JETPORT DRIVE
ORLANDO FLORIDA 32809-7895
TELPHONE (407) 851-4360

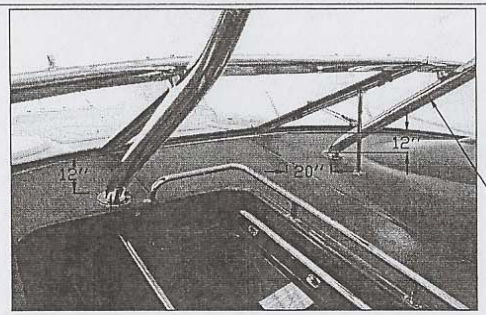
DRAWING TITLE:
ZONE SET UP NOTES

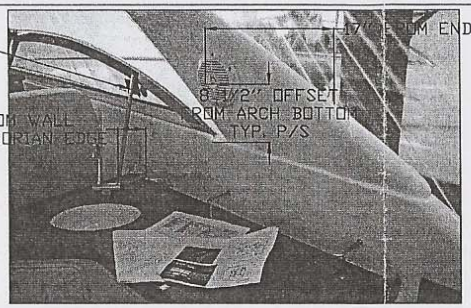
DATE:	LATEST REV LET:	SCALE:
9/14/09		YES
DR. BY: R. Gills D. Colbourne	APP. BY:	DWG. NO.: WS-352

38 EXPRESS TYPICAL FUSION ZONES

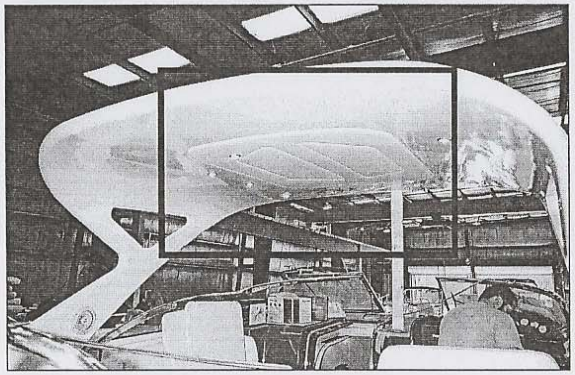


38 EXPRESS TYPICAL AIR CONDITIONING INSTALLATION

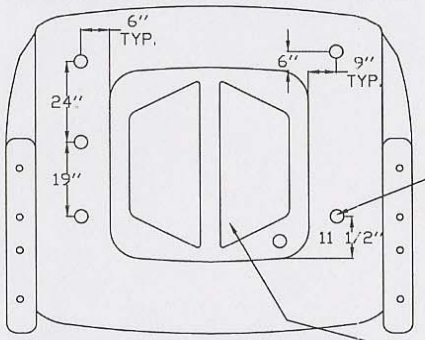




BILL OF MATERIALS				
ITEM	QTY.	SIZE	MATERIAL	PART #
01	2		STANTIONS/ WINDSHIELD SUPPORTS	78530
02	6		LIGHTS	64331
03	2	17'	S/S GRAB RAIL	48851
04	1		VHF ANTENNA	50215
05	3	SMALL	CHROME CLAMSHELL	12829
06	1	300"	CANVAS AWNING TRACK	78302
07	1	160"	CANVAS AWNING TRACK	78302
08	1		T.V. ANT	50321
09	1		MAST LIGHT	64322
10	1		HORN	48345
11	1		GPS ANT.	956804
12	1		STBD. WINDSHIELD SUPPORT	78730
13	1		PORT WINDSHIELD SUPPORT	78731
14	2		KENWOOD SPEAKERS	95713

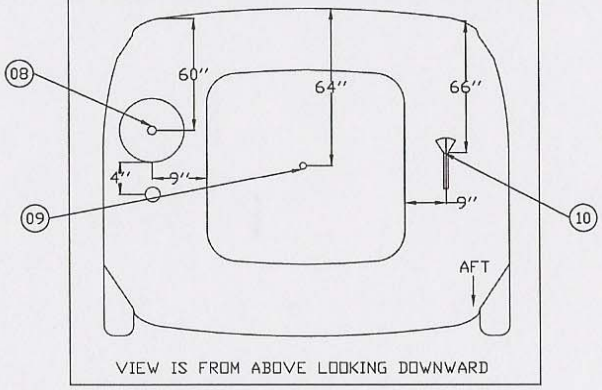


HARDTOP PANEL INSERT-LIGHT LOCATIONS



VIEW IS FROM DECK SOLE LOOKING UPWARD

HARDWARE FOR HARDTOP



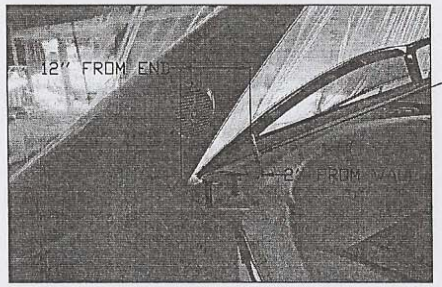
VIEW IS FROM ABOVE LOOKING DOWNWARD

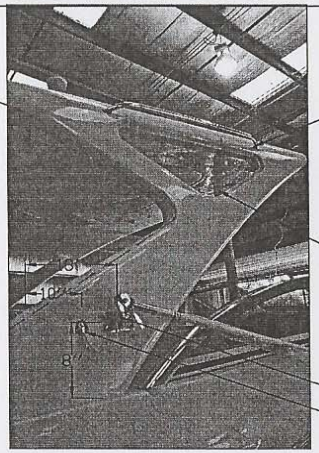
REFERENCE DRAWING UTA18B FOR INFORMATION ON WOOD INSERT PANELS, AND COMAING TAB LOCATIONS

NOTE: RUN CANVAS TRACK ALONG EDGE OF HARDTOP, FRONT EDGE AND AFT EDGE

(06) FWD EDGE TRACK

(07) AFT EDGE TRACK





MOUNT PARALLEL WITH FRONT EDGE OF WINDOW CUTOUT, OFFSET 3 INCHES FROM TOP CUTOUT EDGE

REFERENCE WS-247 (GLASS INSTALLATION) FOR INSTALLATION OF WINDOW PARTS INTO HARDTOP

NOTE: WHEN ROUTING CABLES THROUGH HARDTOP, USE CALM SHELLS AND 920 TO MAKE WEATHER PROOF

REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:

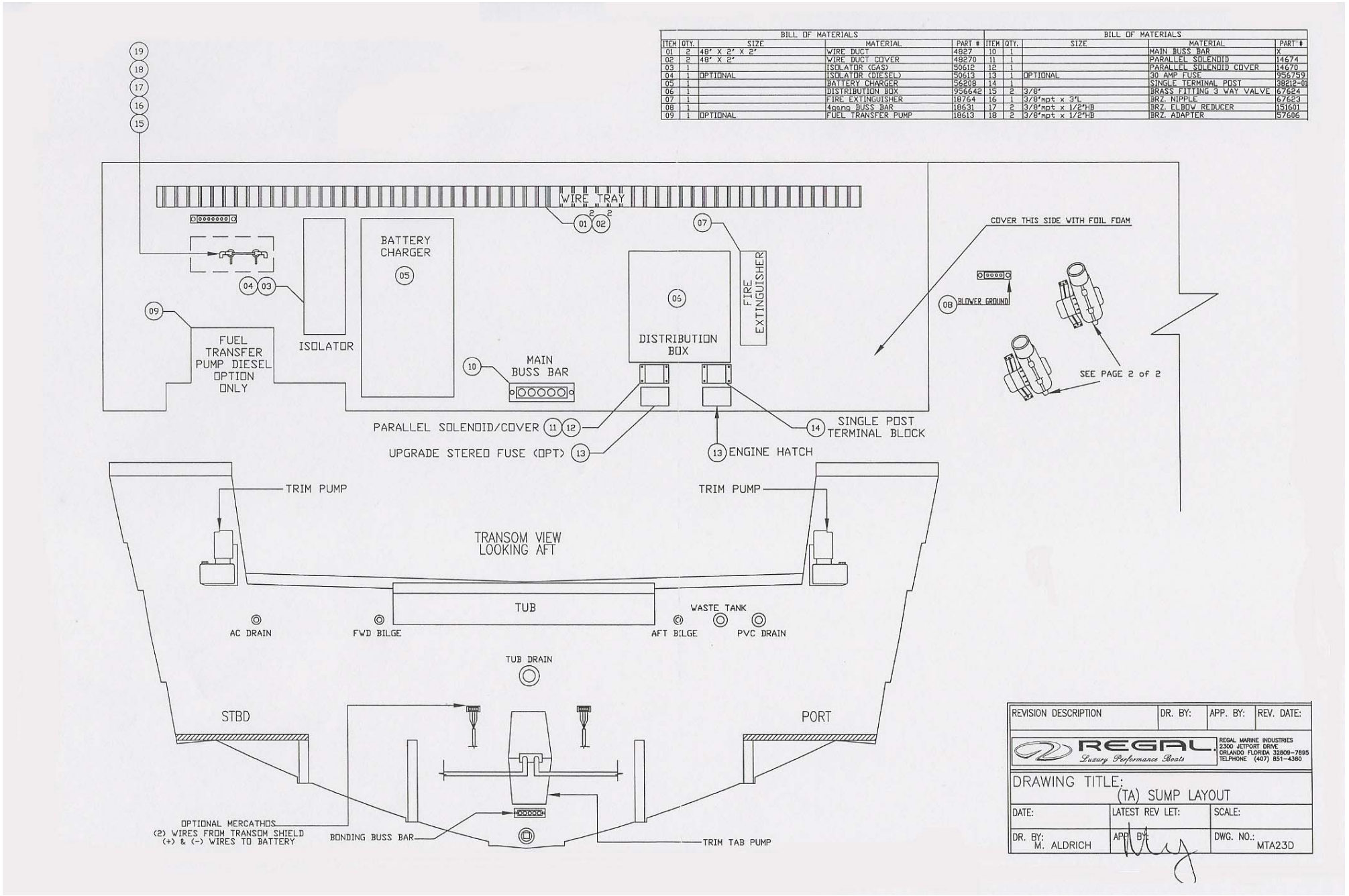
REGAL Luxury Performance Boats

REGAL MARINE INDUSTRIES
2300 JETPORT DRIVE
ORLANDO FLORIDA 32809-7895
TELEPHONE (407) 851-4360

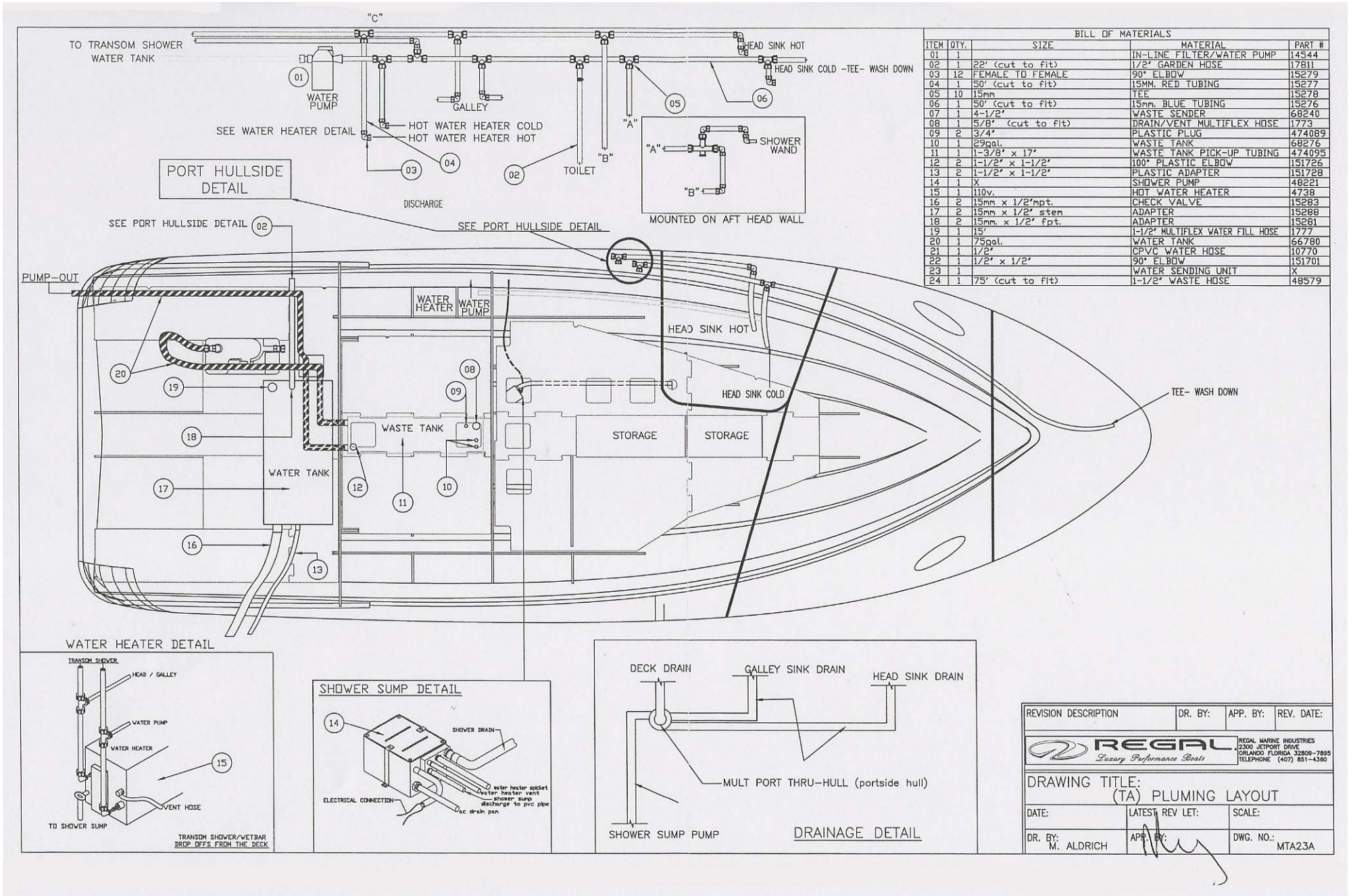
DRAWING TITLE:
(TA) HARDTOP ASSY. INSTALL

DATE:	LATEST REV LET:	SCALE:
DR. BY: DAWLEY	APP. BY:	DWG. NO.: MTA24H

38 EXPRESS TYPICAL HARDTOP INSTALLATION


BILL OF MATERIALS
ITEM | QTY. | SIZE | MATERIAL | PART #
01 | 2 | 48" X 2" X 2" | WIRE DUCT | 4827
02 | 2 | 48" X 2" | WIRE DUCT COVER | 48270
03 | 1 | | ISOLATOR (GAS) | 50612
04 | 1 | OPTIONAL | ISOLATOR (DIESEL) | 50613
05 | 1 | | BATTERY CHARGER | 56208
06 | 1 | | DISTRIBUTION BOX | 956642
07 | 1 | | FIRE EXTINGUISHER | 18764
08 | 1 | | 4gang BUSS BAR | 18631
09 | 1 | OPTIONAL | FUEL TRANSFER PUMP | 18613
BILL OF MATERIALS
ITEM | QTY. | SIZE | MATERIAL | PART #
10 | 1 | | MAIN BUSS BAR | X
11 | 1 | | PARALLEL SOLENOID | 14674
12 | 1 | | PARALLEL SOLENOID COVER | 14670
13 | 1 | OPTIONAL | 30 AMP FUSE | 956759
14 | 1 | | SINGLE TERMINAL POST | 3821-01
15 | 2 | 3/8" | BRASS FITTING 3 WAY VALVE | 67624
16 | 1 | 3/8"npt x 3"L | BRZ. NIPPLE | 67623
17 | 2 | 3/8"npt x 1/2"HB | BRZ. ELBOW REDUCER | 151601
18 | 2 | 3/8"npt x 1/2"HB | BRZ. ADAPTER | 57606
WIRE TRAY
BATTERY CHARGER
05
ISOLATOR
FUEL TRANSFER PUMP DIESEL OPTION ONLY
09
MAIN BUSS BAR
10
DISTRIBUTION BOX
05
FIRE EXTINGUISHER
07
COVER THIS SIDE WITH FOIL FOAM
08 BLOWER GROUND
SEE PAGE 2 of 2
PARALLEL SOLENOID/COVER 11 12
UPGRADE STEREO FUSE (OPT) 13
13 ENGINE HATCH
14 SINGLE POST TERMINAL BLOCK
TRIM PUMP
TRIM PUMP
TRANSOM VIEW LOOKING AFT
TUB
WASTE TANK
AC DRAIN
FWD BILGE
AFT BILGE
PVC DRAIN
TUB DRAIN
STBD
PORT
OPTIONAL MERCATHOS (2) WIRES FROM TRANSOM SHIELD (+) & (-) WIRES TO BATTERY
BONDING BUSS BAR
TRIM TAB PUMP
REVISION DESCRIPTION | DR. BY: | APP. BY: | REV. DATE:
REGAL Luxury Performance Boats
REGAL MARINE INDUSTRIES 2300 JETPORT DRIVE ORLANDO FLORIDA 32809-7895 TELPHONE (407) 851-4360
DRAWING TITLE: (TA) SUMP LAYOUT
DATE:
LATEST REV LET:
SCALE:
DR. BY: M. ALDRICH
APP. BY:
DWG. NO.: MTA23D

38 EXPRESS TYPICAL SUMP LAYOUT



BILL OF MATERIALS

ITEM	QTY.	SIZE	MATERIAL	PART #
01	1		IN-LINE FILTER/WATER PUMP	14544
02	1	22' (cut to fit)	1/2" GARDEN HOSE	17811
03	12	FEMALE TO FEMALE	90° ELBOW	15279
04	1	50' (cut to fit)	15MM, RED TUBING	15277
05	10	15mm	TEE	15278
06	1	50' (cut to fit)	15mm, BLUE TUBING	15276
07	1	4-1/2"	WASTE SENDER	68240
08	1	5/8" (cut to fit)	DRAIN/VENT MULTIFLEX HOSE	1773
09	2	3/4"	PLASTIC PLUG	474089
10	1	29gal.	WASTE TANK	68276
11	1	1-3/8" x 17"	WASTE TANK PICK-UP TUBING	474095
12	2	1-1/2" x 1-1/2"	100° PLASTIC ELBOW	151726
13	2	1-1/2" x 1-1/2"	PLASTIC ADAPTER	151728
14	1	X	SHOWER PUMP	48221
15	1	110v.	HOT WATER HEATER	4738
16	2	15mm x 1/2"mpt.	CHECK VALVE	15283
17	2	15mm x 1/2" stem	ADAPTER	15288
18	2	15mm. x 1/2" fpt.	ADAPTER	15281
19	1	15'	1-1/2" MULTIFLEX WATER FILL HOSE	1777
20	1	75gal.	WATER TANK	66780
21	1	1/2"	CPVC WATER HOSE	10770
22	1	1/2" x 1/2"	90° ELBOW	151701
23	1		WATER SENDING UNIT	X
24	1	75' (cut to fit)	1-1/2" WASTE HOSE	48579

REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:

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2300 JETPORT DRIVE
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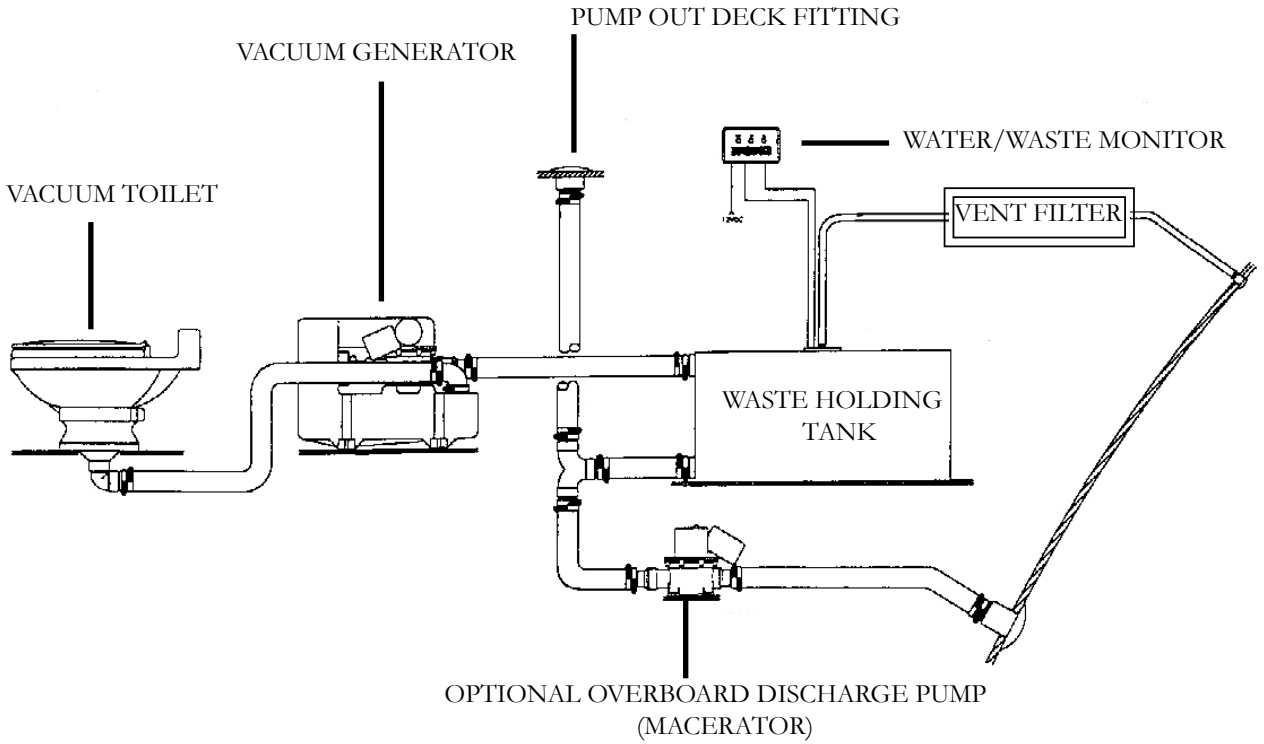
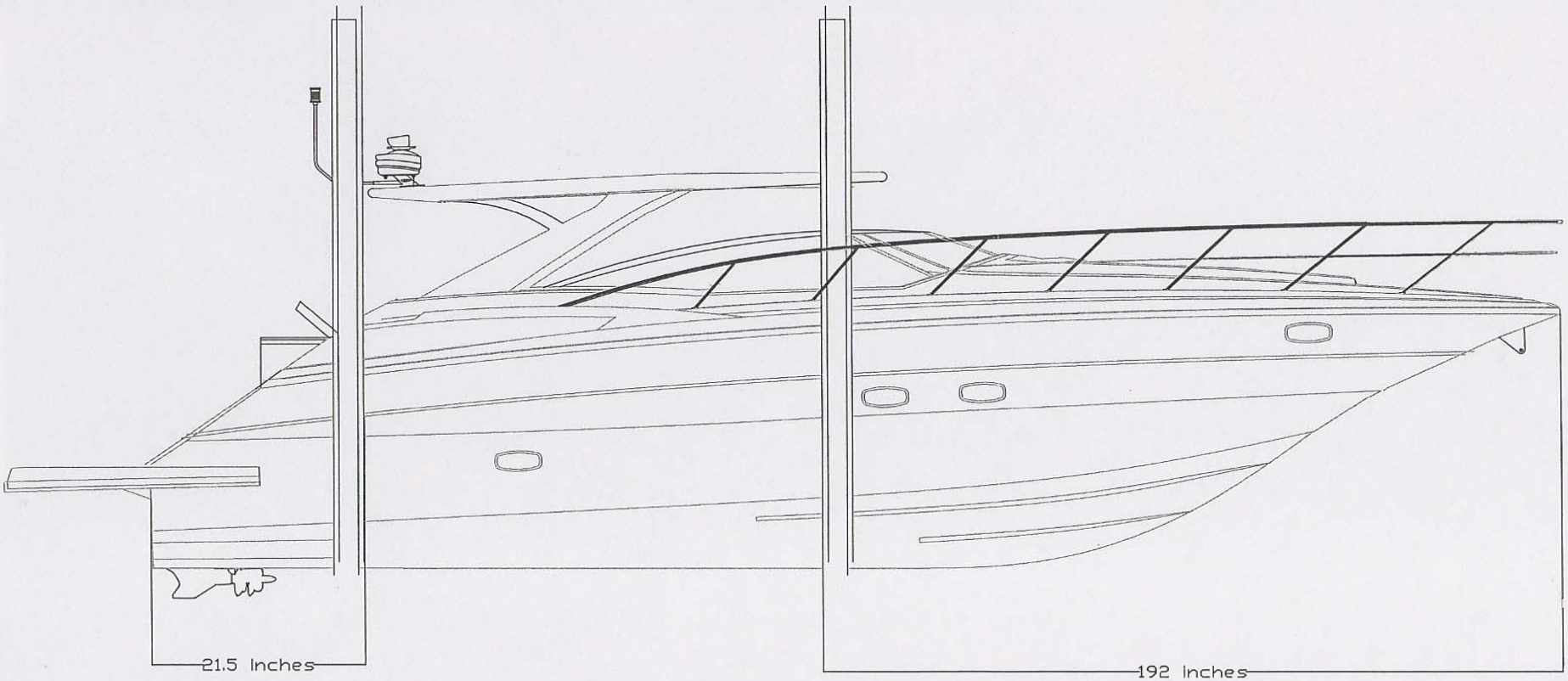
DRAWING TITLE: (TA) PLUMING LAYOUT

DATE:	LATEST REV LET:	SCALE:
DR. BY: M. ALDRICH	APP. BY:	DWG. NO.: MTA23A

38 EXPRESS TYPICAL PLUMBING LAYOUT



38 EXPRESS TYPICAL VACUUM TOILET PLUMBING LAYOUT



REV. #	DR. BY:	APP. BY:	REV. DATE:

REGAL
Luxury Performance Boats

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DRAWING TITLE:
TA BOAT DIMENSIONS

DATE: 04-16-2008	CHECKED BY:	PAGE:
DR. BY: C.Caines	APP. BY:	DWG. NO.: MTA25C

38 EXPRESS TYPICAL SLING LOCATIONS